

MANUAL OF INSTRUCTIONS FOR USE AND MAINTENANCE



Free Mobile Green ENERGY



mobile solar PV generator

www.ikube.it



Instruction and Maintenance Release 1

Completed in July 2012

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Pro D3 srl

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TABLE OF CONTENTS

BACKGROUND **Page 5**

0. The purpose of the instruction manual
1. How to read the instruction manual
2. Preservation of the instruction manual
3. Updating Manual
4. Recipients
5. Glossary and pictograms

GENERAL INFORMATION **Page 12**

1. Identification of manufacturer data
2. Identification and license plate of the machine data
3. Statements
4. Safety Standards
5. Technical support information
6. Preparation of customer load

SAFETY **Page 16**

1. General warnings
2. Intended Use
3. Contraindications of use
5. Danger zones
5. Safety Devices
6. Signposting
7. Residual risks

INSTALLATION **Page 25**

1. Shipping and handling
2. Storage
3. Preparation
5. Positioning
5. Opening
6. Links
7. Principles of grounding system iKube
8. Preliminary checks on power

DESCRIPTION OF MACHINE

Page 43

1. Operation principle
2. Key Components
3. Size
4. Vibration
5. Noise emissions
6. Standard delivery
7. Electromagnetic Environment

USING THE MACHINE

Page 54

1. Console
2. Mass In Function
3. Modes of Operation
5. Normal Shutdown
5. Emergency Stop
6. Restoration
7. Putting Out of Service

MAINTENANCE

Page 57

1. State of maintenance
2. Isolation of the machine
3. Special Precautions
4. Cleaning
5. Lubrication
6. Routine maintenance
7. Extraordinary maintenance
8. Diagnostics and Troubleshooting

ACCESSORY PARTS

Page 61

1. Assistance
2. Parts

ADDITIONAL INSTRUCTIONS

Page 62

1. Waste disposal
2. Decommissioning and dismantling

BACKGROUND

1. The purpose of the instruction manual

This instruction manual is an integral part of the machine and has the purpose to provide all the information necessary to:

- Proper awareness of security issues;
- The manipulation of the machine, packed and unpacked in safe conditions;
- The correct installation of the machine;
- A thorough knowledge of its operation and its limitations;
- Its proper use in safety;
- Performing maintenance, properly and safely;
- Dismantle the machine safely and in compliance with applicable regulations to protect workers' health and the environment.



Those responsible for the installation of the iKube machine, are obliged, under current rules, read the contents of this Instruction Manual and read it to tenants and maintenance workers, for the parts that fall to them.

The time taken for this purpose will be largely compensated by the proper functioning of the machine and its use in conditions of safety.

The instructions, drawings and documents contained in this manual are of technical confidential nature, close property of the manufacturer and may not be reproduced in any way, either entirely or partially.

The customer has the responsibility to make sure that if this document is changed by the manufacturer, only updated versions of the Handbook are actually present at the point of use

2. How to read the instruction manual

- The Manual is divided into independent chapters, each of which is addressed to a specific operator (INSTALLAT, LEADER AND MAINTENANCE), for which you have defined the skills necessary to operate the machine safely.
- The sequence of chapters responds to the temporal logic of life of the machine.
- To facilitate understanding of the immediacy of the text, terms, abbreviations and pictograms are used, whose meaning is stated in par.6.
- The Manual consists of a cover, an index and a series of chapters (sections).

1. Preservation of the instruction manual

- The Manual should be stored with care and must accompany the machine in all transfers of property that it may have in its lifetime.
- Storage should be favored handling it with care, with clean hands and not depositing it on dirty surfaces.
- Parts must not be removed, torn or arbitrarily modified.
- The Manual is stored in an environment protected from moisture and heat and in the immediate vicinity of the machine to which it relates.
- The manufacturer, at the request of the User, may provide additional copies of the Manual of the machine.

4. Updating the instruction manual

The manufacturer reserves the right to modify the project and make improvements to the machine without telling the customer, and without updating the Handbook already delivered to the user.

Moreover, in case of changes to the installed machine at the customer, agreed with the manufacturer and that results in the modification of one or more chapters of the Manual, it will be sent to the holders of the manufacturer's Instruction Manual involved the chapters affected by the change , with the new model of comprehensive review of the same.

It is the responsibility of the user, following the directions that accompany the updated documentation, to replace all the old copies held with new chapters, the starting page and the index with those with the new revision level.

The manufacturer is responsible for the descriptions in Italian language, any translations may not be fully verified,

so, if inconsistency is detected, rely on the Italian language and possibly contact our technical department, who will carry out the modifications it deems appropriate.

5. Recipients

The manual in question is addressed to: Installer, Operator and Service Persons entitled to maintenance.

It specifies that "operator" means the staff responsible for operating, adjusting, cleaning, performing maintenance on the machine.

"QUALIFIED PERSONNAL or QUALIFIED OPERATOR" shall mean those persons who have completed specialized courses, training, etc.. and have experience related to installation, commissioning and maintenance, repair, transportation.

"EXPOSED PERSON" any zone within and / or around machinery in which the presence of a person constitutes a risk to the security, health or safety of that person.

"MACHINE SHUNTER" means a Qualified Operator who has been particularly trained in the use of the plant and which, having a general knowledge of the machine, is able to indicate any malfunctions and to require specific interventions for servicing.

"TECHNICIAN" means a person who, according to their professional training and experience, possesses sufficient technical knowledge on specific machines and is able to assess the condition of full efficiency, and to plan and coordinate any maintenance.

The technician knows enough about laws regarding workplace safety, accident prevention regulations, guidelines and criteria of good.

"QUALIFIED TECHNICIAN" means a person authorized to verify the machine, as well as of Controlling surveyors, engineers graduates or members in their respective professional bodies recognized by the body to the Prevention of Accidents.

QUALIFICATION OF RECIPIENTS

The machine is intended both for domestic and professional use, but its use may be entrusted to qualified figures, in particular that:

- Have reached the age of majority;
- Are physically and mentally fit to perform the work of particular technical difficulty;
- Have been properly instructed in the use and maintenance of the machine;
- In the case of business use have been deemed suitable by the employer to carry out the task entrusted to him, after attending a special course of information, education and training, organized by the employer, pursuant to art. 36 and 37 of Legislative Decree 81/08.;
- Are able to understand and interpret the operator's manual and safety regulations;
- Know emergency procedures and their implementation;
- Possess the ability to operate the specific type of equipment;
- Are familiar with the specific rules applicable;
- They understand the operating procedures defined by the manufacturer of the machine.

6. Glossary and pictograms

This paragraph lists the terms that are uncommon or have a meaning different from the ordinary.

The following explains the abbreviations used, and the meaning of the pictograms to indicate the operator status and the state of the machine, their use allows to provide information necessary for the proper use of the machine in conditions of safety rapidly and unequivocally.

Glossary

DANGER ZONE: Zone in and / or near the machine where the presence of a person constitutes a risk to the safety and health of the person (Annex I, 1.1.1 Directive 2006/42/EC);

EXPOSED PERSON: Any person who is wholly or partially in a danger zone (Annex I, 1.1.1 Directive 2006/42/EC);

OPERATOR: Person in charge of installing, operating, adjusting, maintaining, cleaning, repairing or transporting the machine (Annex I, 1.1.1 Directive 2006/42/EC);

MAN-MACHINE INTERACTION: Any situation in which an operator interacts with the machine in any of the stages operating at any time during the life of the same;

OPERATOR QUALIFICATIONS: Minimum level of competence which the operator must possess to perform the operation described;

NUMBER OF OPERATORS: Number of operators optimally adapted to the process described, and is the result of a careful analysis made by the manufacturer, so the user of a different number of employees could prevent you from getting the expected result or endanger safety of personnel involved;

STATE OF THE MACHINE: The state of the machine includes the operating mode, for example, automatic gear, maintained action control (jog), shutdown, etc.. the condition of safety devices on the machine like protectors included, excluded patrons, emergency stop pressed, insulation type of renewable energy, etc..

RESIDUAL RISK: Risk that could not be eliminated or sufficiently reduced by design, against which the guards are not (or are not totally) effective, the user is given the information of its existence and the instructions and warnings to allow exceeded (see, respectively, 5.4 and 6.5.1 of the European standards EN 12100-1 and EN 121000-2);

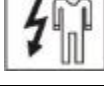
COMPONENT OF SAFETY: It means a component used to provide a safety function and whose failure or malfunctioning endangers the safety and / or health of persons exposed (eg. lifting tool; fixed, mobile, adjustable protector, etc., electrical device, electronic, optical pneumatic, hydraulic, that enslaves, ie interlocks, a protector, etc..).

SYMBOLS:



Descriptions preceded by this symbol contain: information / requirements that are very important, particularly as regards security. Their ignorance could result in: danger to the safety of workers, loss of the warranty, declination of the manufacturer's responsibility.

Symbols related to the position of the operator:

Symbol	Description
	<i>Generic Worker</i> operator with no specific skills, able to perform only simple tasks of the provisions of qualified technicians.
	<i>Conductor of the machine level 1</i> : operator with no specific skills, capable of performing only simple tasks, i.e. the operation of the machine through the use of the buttons arranged on the panel, loading and unloading of materials used during production, with guards in place and active, is not enabled for use of the not working machine with maintained action command (JOG).
	<i>Conductor of the machine level 2</i> : The personnel capable of performing the tasks of the conductor level 1 and, moreover, able to operate the machine with maintained action command (JOG), to perform simple functions, typically start the production or its recovery following a stop and adjustment.
	<i>Mechanical Maintenance</i> : qualified technician, able to operate the machine under normal conditions, to make it work with maintained action command (JOG) with disabled protections, to intervene on the mechanical parts to make adjustments, maintenance and repairs. Typically is not qualified to work on electrical systems in the presence of voltage.
	<i>Electrical Maintenance</i> : qualified technician, able to operate the machine under normal conditions, to make it work with maintained action command (JOG) with disabled protections, it is proposed that all operations of electrical control, maintenance and repairs. Able to operate in the presence of voltage cabinets and junction boxes.
	<i>Constructional Technician</i> : technician made available by the manufacturer to perform operations of complex nature in particular situations, however, agreed with the user. The skills are, as appropriate, mechanical and / or electrical and / or electronic and / or software.

Pictograms relating to the state of the machine

Symbol	State of Machine
	Machine off: with electricity and pneumatic power cut.
	Machine is turned on: with a supply of electric and pneumatic power connected and in a stop condition and secure with emergency button in position restraint or other control member for this purpose, situated near the area of intervention (specifying the fungus or organism to be used).
	Machine on: firm and ready for departure (conditions of stand-by mode) using consent functional activation (eg. product presence), a closed cabinet with protective safety device including protectors and fixed closed.

Safety pictograms

Pictogram	Denomination:
	Dangerous voltage
	Crushing of the upper limbs
	Beware of batteries
	Do not remove the safety devices
	In case of fire do not intervene with water
	Prohibition of work prior to removing the tension
	Gloves for protection against electrical hazards required for maintenance of the battery
	Safety goggles required when servicing the battery

GENERAL INFORMATION**1. [Data](#) identifying the company****➤ MANUFACTURER****PRO D3 SRL****➤ HEADQUARTERS - ADMINISTRATIVE**

Via Ettore Bugatti 3/9
10040 Leini (TO) - IT

➤ SERVICE POST-VENDITA/RICAMBI

Tel: +39 0119983553 - Fax: 0119966521

Email: info@prod3.it

2. [Data](#) identification and license plate of the machine

Each machine is identified by a CE plate on which the reference data are reported.

For any communication with the manufacturer or service always refer to these references.

EUROPEAN DIRECTIVE 2006/42/CE		
DESCRIPTION iKube	MODEL F 150	SERIAL NUMBER 000001
CURRENT ALTERNATA 1F + N	FREQUENCY 50 HZ	RATED VOLTAGE 230 V
BATTERY PACK 245 Ah - 48 V	GENERATOR POWER 1,4 kW	
IP CERTIFICATION IP 33	COMPATIBLE SYSTEM TT / TN	
YEAR 2012	TEMPERATURE - 5°C : 40° C	TOTAL WEIGHT 500 Kg



Via Ettore Bugatti 3/9
10040 Leini (TO)
Italy
Made in Italy

1. Statements

The machine is made in accordance with the relevant EU directives applicable at the time of its launch.

DECLARATION OF CONFORMITY

Dir 2006/42/EC annex IIA

The Builder

PRO D3 SRL

Postal address

Via Ettore Bugatti 3/9 10 040 Leini (TO)

DECLARES THAT

Machine

iKube

Model

F150

Year of manufacture

2012

CONFORMS TO THE DIRECTIVES

EC Council Directive 2006/42

On the approximation of the laws of the Member States relating to machinery.

EC Directive 2004/108

on the approximation of the laws of the Member States relating to electromagnetic compatibility.

EC Directive 2006/95

on the approximation of the laws of the Member States relating to electrical equipment designed for use within certain voltage limits.

Harmonized technical standards

EN ISO 12100-1, EN ISO 12100-2, UNI EN ISO 13850, UNI EN ISO 13857, EN 60204-1, UNI EN ISO 14121-1, EN 953

AND AUTHORIZES

Dr. Mr. Massimiliano Vannutelli, owner of Studio Engineering Technician M. Vannutelli

based in Paris Avenue 7-03100 Frosinone (FR) - IT

TO CONSTITUTE A TECHNICAL DOCUMENT FOR THE SAME

Leini, 01/07/2012

The manufacturer

Mr. Mario Alberto Osella

Managing Director



PROHIBITION OF SERVICE

It can not be put into service after undergoing structural alterations or additions of parts not covered by the ordinary and extraordinary maintenance without again found to comply with the requirements of Directive 2006/42/EC and other directives applicable reference

Leini, 01/06/2012

The manufacturer
Mr. Mario Alberto Osella

4. Safety Standards

The device has been designed in accordance with the Harmonized Technical Standards listed below:

EN ISO 12100-1	Safety of machinery - Basic concepts, general principles for design-Part 1: Basic terminology, methodology;
EN ISO 12100-2	Safety of machinery - Basic concepts, general principles for design-Part 2: Technical principles;
UNI EN ISO 13850	Safety of machinery-Emergency stop system, functional aspects;
UNI EN ISO 13857	Safety of machinery-Safety distances to prevent danger zones being reached by upper and lower limbs;
EN 60204-1	Safety of machinery-Electrical equipment of machines-Part 1: General rules;
UNI EN ISO 14121-1	Safety of machinery-Risk Assessment-Part 1, Principles
UNI EN ISO 14121-1: 07	Safety of machinery-Principles for risk assessment;
EN 953	Safety of machinery-Guards-General requirements for the design and construction of fixed and movable guards;

5. Technical support information

The machines are covered by warranty, as provided in the contract of sale. If during the period of validity malfunction or failure of machine parts occurs, which fall in the circumstances specified by the warranty, the manufacturer, after the necessary checks on the machine, will repair or replace defective parts.

Please note that editing operations performed by the user, without the expressed written permission of the manufacturer, will void the warranty and release the manufacturer from any liability for damage caused by a defective product.

This applies in particular when these changes are performed on a safety device, degrading their effectiveness.

The same considerations apply when using non-original spare parts or other than those explicitly specified by the manufacturer as "SAFETY DEVICES".

For all these reasons we recommend our customers to always ask our Customer Service.

6. Preparation by customer

Without prejudice to any other contractual agreements, are normally charged to the customer:

- Preparation of the premises, including any building work and / or ducts required;
- Power supply of the machine, according to current standards in the country of use;

It's important to check beforehand that the infrastructure, in which the machine is installed, is adequate to allow proper use and to facilitate maintenance.

During installation, check that there is no interference between moving parts and fixed infrastructure (concrete beams, windows, lamps, railings, etc ...).

Check that the operator has full visibility and adequate lighting of the operational area.

Inside the building are to be affixed to the signs (with the user) to ensure that people in occasional transit see information on most basic security.

It's very important that warning signs are always legible, maintained in good condition and are of a type approved.

It must also be preserved, along with this manual, the declaration of suitability of structures prepared by a qualified professional, based on actual loads related to the installed machine.

SAFETY

➤ General warnings



Before returning the machine, read the operating instructions in this manual and carefully follow the directions in this document.

The manufacturer has made every effort in the design of this machine, as was possible, INTRINSICALLY SAFE.

It also has all guards and safety devices deemed necessary, and finally, given sufficient information for it to be used safely and correctly.

To this end, in each chapter, when necessary, for any human-machine interaction, have been given the following information:

- Minimum qualifications required of the operator;
- Number of workers required;
- State of the machine;
- Residual risks;
- Personal protective equipment required or recommended;
- Prevention of human errors;
- Prohibitions / obligations relating to reasonably foreseeable misconduct.



This information must be scrupulously respected.

The user can usefully complement the information provided by the manufacturer's instructions with additional work, not in contrast with those reported in this Instruction Manual, in order to contribute to the safe operation of the machine.

For example, you must pay close attention to clothing that everyone wears who comes in contact with the machine:

- Do not wear clothing with handles that can be attached to parts of the machine

- Avoid using ties or other loose pieces of clothing;
- Avoid wearing bulky rings or bracelets that might catch your hands to the organs of the machine.

When necessary, further recommendations on preventive measures, on personal protective equipment, information to prevent human errors and prohibitions relating to not reasonably foreseeable behavior will be specified in the Manual.

However, it is essential to carefully follow the following information:

- It is absolutely forbidden to operate the machine in automatic mode with fixed guards and / or furniture removed;
- It is absolutely forbidden to inhibit the safety devices installed on the machine;
- The reduced security operations must be carried out in strict accordance with the instructions provided in the descriptions;
- After an operation with reduced safety status of the machine with active protection must be restored as soon as possible;
- The cleaning should be performed with electrical isolation devices cut;
- Do not change any parts of the machine in case of malfunction due to a failure to comply with the above, the manufacturer is not liable for the consequences. It is advisable to request any changes directly from the manufacturer;
- Clean the upholstery of machines, panel and controls with soft, dry cloth or moistened tissue with a mild detergent solution, do not use any type of solvent such as alcohol or petrol, as they may damage the surfaces;
- Place the machine on order as determined according to the diagrams provided by the manufacturer, otherwise no responsibility is taken for any inconvenience.

**IMPORTANT!**

The manufacturer believes it is relieved of all liability for damages caused by the machine to persons, animals or property when:

- use of the machine by personnel not adequately trained;
- misuse of the machine;
- defective power supply;
- incorrect installation;
- lack of maintenance;
- unauthorized modification or intervention;
- use of unauthorized or non-model-specific parts;
- Failure to comply with all or part of the instructions;
- use contrary to national specifications;
- disasters and exceptional occurrences.

General requirements

The moving parts should always be used in accordance with the requirements of the manufacturer as specified in this manual, which must always be available in the workplace. All safety equipment placed on moving parts to prevent accidents and ensure safety cannot be changed nor removed, but it must be adequately safeguarded. In the case of professional use, the user must inform the employer or his immediate supervisor of any defects or abnormalities presented with moving parts.

Checks and verifications

If worn or defective parts are not promptly replaced, the manufacturer assumes no liability for damages that may result from accidents. The checks must be carried out by a skilled person; should be of a visual and functional one, with the aim to ensure the safety of the machine. They include:

- verification of all supporting structures, which must not show cracks, breakage, damage, deformation, corrosion, wear or alteration compared to the original characteristics;
- verification of all the mechanical organs;
- verification of all safety devices installed on the machine;
- check all the connections with pins and screws;
- Functional testing of the machine;
- checking the status of the machine;
- Verification of the electrical system of the machine;

The results of this verification shall be recorded on a separate sheet.

**WARNING!**

Should any abnormalities be detected, they must be removed before restarting the machine, and the expert performing the verification should write the reparation on the sheet, thus giving the green light to use the machine.

The person running the test, if found dangerous cracks or faults must promptly inform the manufacturer of the machine.

- Put the machine out of service when there are abnormalities of operation, the appropriate checks and / or repairs.
- Make sure that between the machine parts, there are no foreign objects to its operation.
- Check that after any maintenance remains no object between the moving parts.

In order to guarantee the maximum safety in the handling of the machine it is FORBIDDEN:

- Forging machine parts;
- Leaving items unattended mobile;
- Use the machine running, but not in full efficiency;
- Changing the machine to change the use originally established, without the expressed permission of the manufacturer or without the assumption of full liability imposed by the Decree. 17/2010 (New Machinery Directive);

During regular monitoring and maintenance of Machine "iKube", pay special attention to moving parts, such as device handling and mounting of the photovoltaic panels.

2. Intended Use

The machine "iKube" was designed and built to generate electricity when turned on and placed under a light source like the Sun, also has the ability to recharge its batteries when connected to the electricity network, as specified later.

To prevent injuries to people who are nearby, it is important to be familiar with both the machine and the PRACTICES FOR SAFE OPERATION.

No operator shall use the machine if not familiar with its operation, without having the physical and / or mental abilities or if they have not been informed of the practices for safe operation.



IMPROPER USE OF THE MACHINE CAN CAUSE RISKS TO THE PEOPLE WHO USE IT, THOSE THAT ARE NEARBY, THE RISKS CAN BE AVOIDED WITH INTELLIGENCE AND COMMON SENSE.

Practices for safe operation include a program of inspections and periodic maintenance (see "audit log"), the operator must be aware of the failures / risks that require adjustments or require the intervention of a competent person.

The monitoring and maintenance programs have an important role in security, it is important that maintenance is carried out on time and that the equipment corresponds to the task, with no violations to the relevant safety standards.

3. Contraindications of use

The machine must not be used:

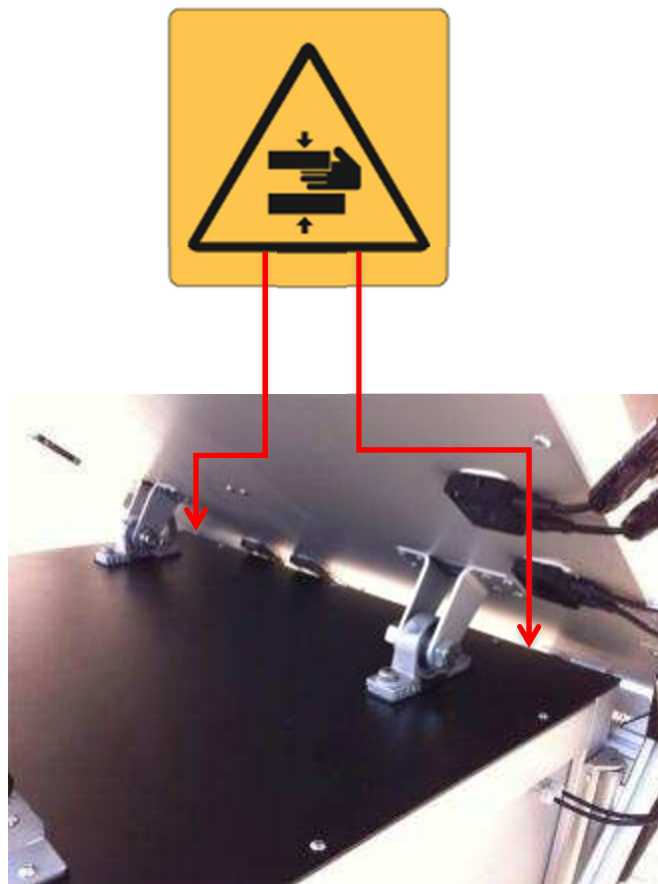
- For uses other than those in 2.2, or for uses not described in this manual;
- In an explosive or corrosive atmosphere, or high concentration of dust or oily substances suspended in the air;
- In a fire hazard atmosphere;
- With safety devices excluded or not working
- With electrical jumpers and / or mechanical means excluding utilities / parts of the machine.

The maneuvers are entrusted exclusively to the machine operator who must be very careful to avoid dangerous situations, such evaluation must be considered above all dynamic conditions, then shifts and load fluctuations arising therefrom.

4. Danger zones

The dangerous areas of the machine "iKube" are only limited to the following areas:
under the solar panels, where if you are not careful you may suffer the crushing of the fingers, inside the battery case, where there is a risk of electrocution, and inside of the inverter and fuse , where there is the same risk.

To limit the risk of squeezing fingers, it was decided to apply adhesive labels to draw attention of the operator not to put fingers where they could be pinched during the handling of the photovoltaic panel.



To reduce the risk of electrocution, closure panels of the compartments were made in which the batteries and the inverter are housed respectively. Adhesive labels on the presence and the presence of battery voltage have also been applied.



The closure panels have been made of adequate mechanical strength and degree of protection (IP33), so as to allow simultaneously an adequate dispersion of heat, weather protection and the inability to come into contact with live parts.

Also on this machine there is an emergency mushroom button,

5. Safety Devices

The machine is installed the following safety devices:

- Emergency power supply stop button;
- Panels for the protection of housing compartments inverters and batteries;
- Differential circuit breaker ABB DS202C L C25, with breaking I_{cn} KA = 4.5 and sensitivity of 30 mA, which is used as a protective device against the current ground fault and overcurrent or short circuit.
- Emergency stop mushroom, push-off power after using the first circuit breaker and take actions that could put the operator in contact with live parts, such as during the opening panel protection when maintenance activities. This way there no risk of coming into contact with live parts



6. Signposting

The signage is installed on the machine is as follows:

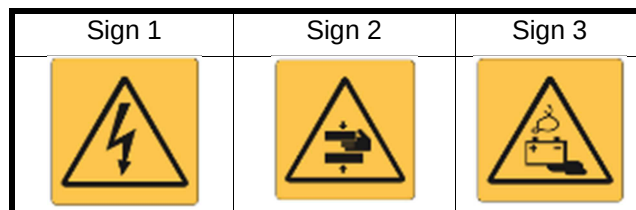
Prohibition signs:

1. Sign indicating the prohibition of removing the safety devices or guards of the machine;
2. Sign indicating a prohibition on working and running until you have been disconnected.
3. Sign indicating the prohibition of using water to extinguish fires.



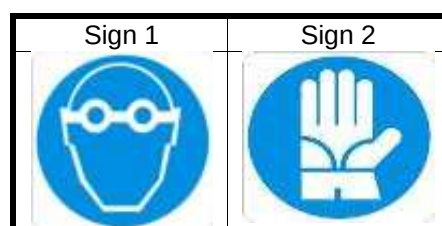
Danger Signs:

1. Sign indicating the danger of dangerous electrical voltages;
2. Sign indicating the danger of being crushed;
3. Sign indicating the presence of electric batteries;



Obligatory signs list:

1. it is compulsory to wear glasses when servicing batteries;
2. it is required to wear gloves for protection against electrical hazards during maintenance of batteries.



7. Residual risks

DEFINITION OF RESIDUAL RISK:

"Danger is not completely reducible through the planning and protection techniques, ie. not obvious potential danger."

In the design phase a careful analysis of risks to which workers may be exposed to during operations and maintenance was carried out and, consequently, every precaution possible was taken to make the machine safe and reliable.

During the carried out analysis, however, special conditions resulting in residual risk occurred, highlighted below, which cannot be overcome with standard technical devices but only by empowering the users of the machine with following the most basic safety rules.

It is necessary to pay attention to the following residual risks that are present during the use of the machine and that cannot be eliminated.



WARNING: DANGEROUS MOVEMENT

Around the machine, people other than the operator must not during the phase of opening, closing and positioning of the photovoltaic panels. In the presence of third persons, immediately stop the movement, and force them to leave.



CAUTION: RISKS FOR ELECTRICAL PARTS IN USE

The maintenance personnel before entering the compartment inverter, the battery compartment or all those parts that are under tension during operation, they must open the power switch of the electrical power supply line of the machine.

Then you must press the emergency button.

Operations are permitted with the machine power System (Category 1) only by qualified electrical maintenance personnel to CEI 11-27 and declared fit by your employer.

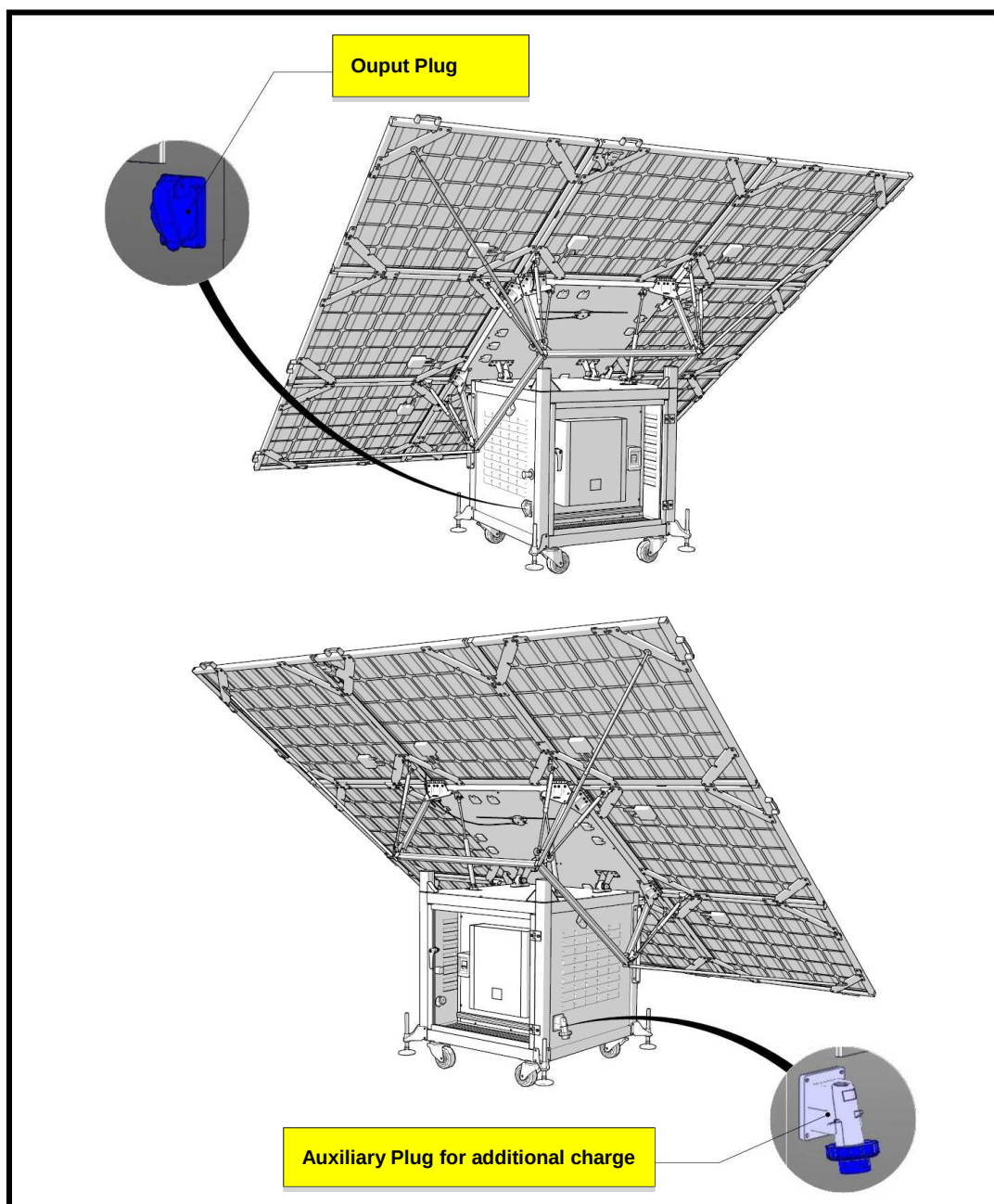
The maintenance system should be entrusted only to qualified operators.

INSTALLATION

1. Shipping and handling

For the transportation and handling of the machine three operations are required:

1. Disconnect the power cables from the two side plugs;

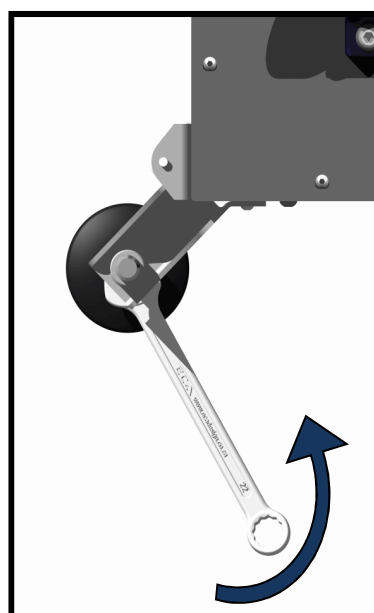
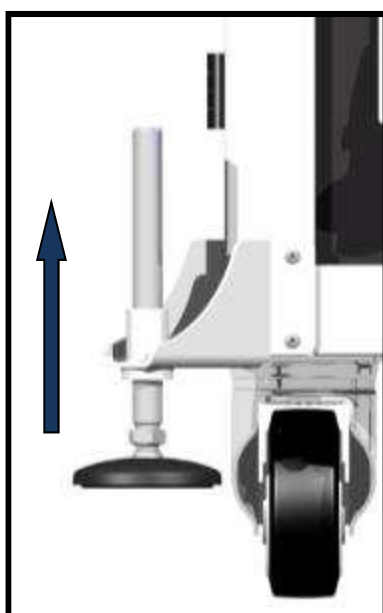


2. Close the photovoltaic panels to obtain the compact structure;



Ensure that the pairs of panels are kept closed by the special buckles supplied velcro.

3. Raise the stabilizers of the machine to the limit:



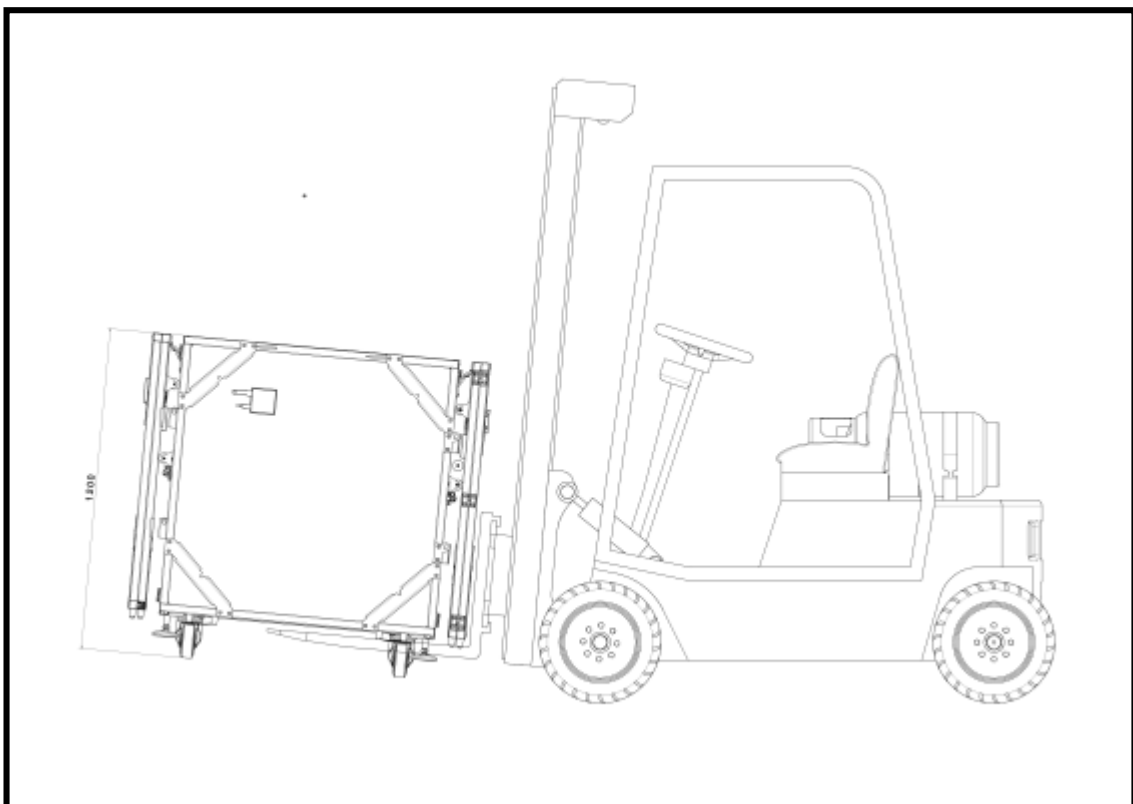
For short flat sections (few meters) you can push "ikube" until it reaches the desired position. If you need to move the machine over longer distances, you should create a package to protect iKube from bumps and unwanted contacts. It's necessary to use slings to be passed around iKube, then lift the machine with a forklift or other lifting device that can withstand weight and size. Keep in mind that iKube mod.0 F15 weighs about 550 kg and occupies the space of 1.8 m³. At this point you can bring iKube to your destination with the same truck, moving at a crawl, taking care not to subject it to shock, or place it on a vehicle.

Always verify the correct load balancing when they are transported in such a way as to prevent unexpected trips, falls on the floor of the machine, damage to property and persons who are within range.

Unload carefully to place iKube on flat ground.



The manufacturer is not liable for damages to persons or property for the use of lifting equipment other than those described above.

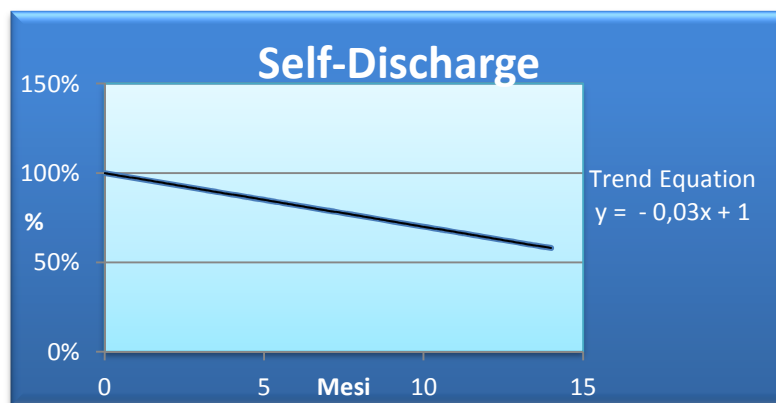


1. Storage

In case of inactivity, the machine must be stored taking the following precautions:

- Store the machine in a confined space;
- Protect the machine from shocks and stresses;
- Protect the machine from humidity and high temperature;
- Do not place the machine in contact with corrosive substances.
- Turn off the inverter

During periods of inactivity batteries undergo a process of natural discharge described in the following graph:



3. Preparation

For the installation an area for maneuver for the size of the machine and the means of lifting selected should be prepared.

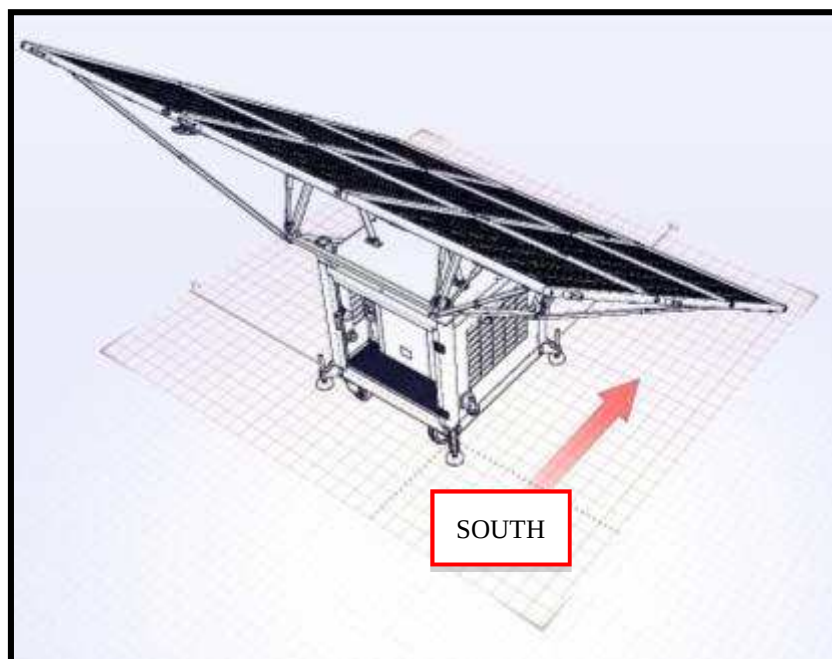
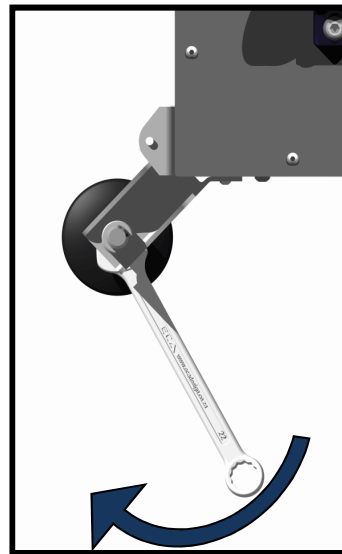
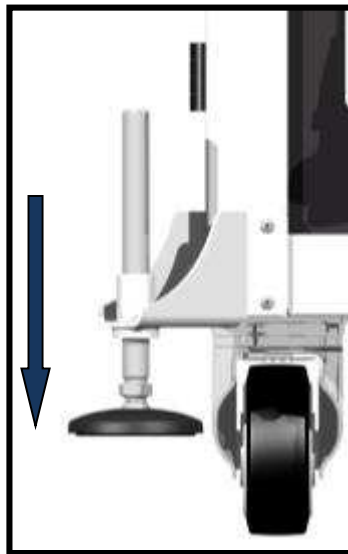
The preparation of the machine must be carried out in such a way as to optimize the ergonomics and the safety of the work place: leave in a sufficient area to allow easy manual operations and handling of the material to be processed and for the operations of maintenance and adjustment.

Adequate security measures must be provided for its operation as required for safety in the workplace.

4. Positioning

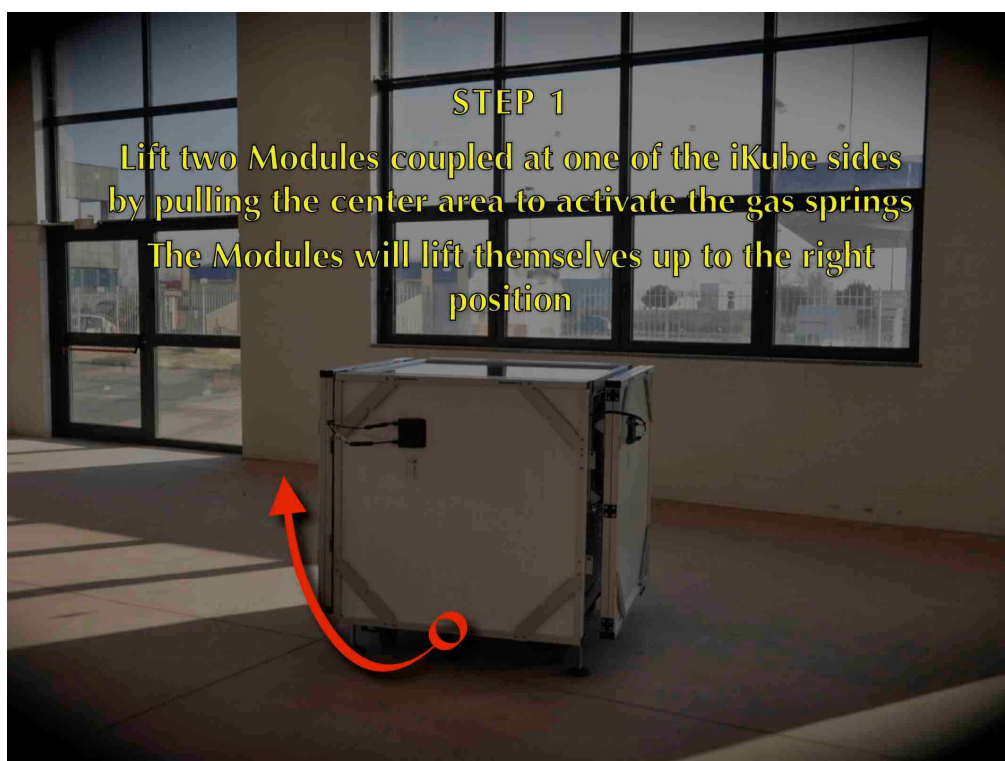
The machine comes packed already assembled, so just remove the package and place it in the desired position. Bring a compass. Ensure that the face of the cube is positioned so that the inverter is facing north so that opening the solar sail is perfectly facing south so as to optimize the production of electricity from solar energy.

Once positioned the machine in the manner described above to obtain a key no. 22 and lower the stabilizer feet to touch the ground.



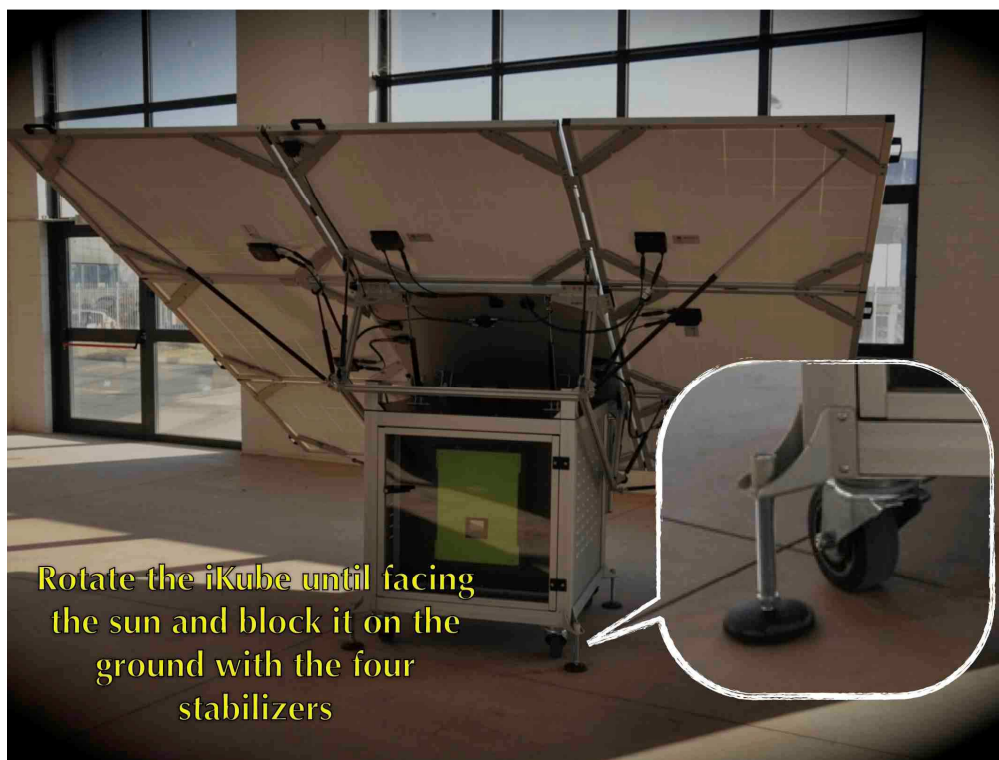
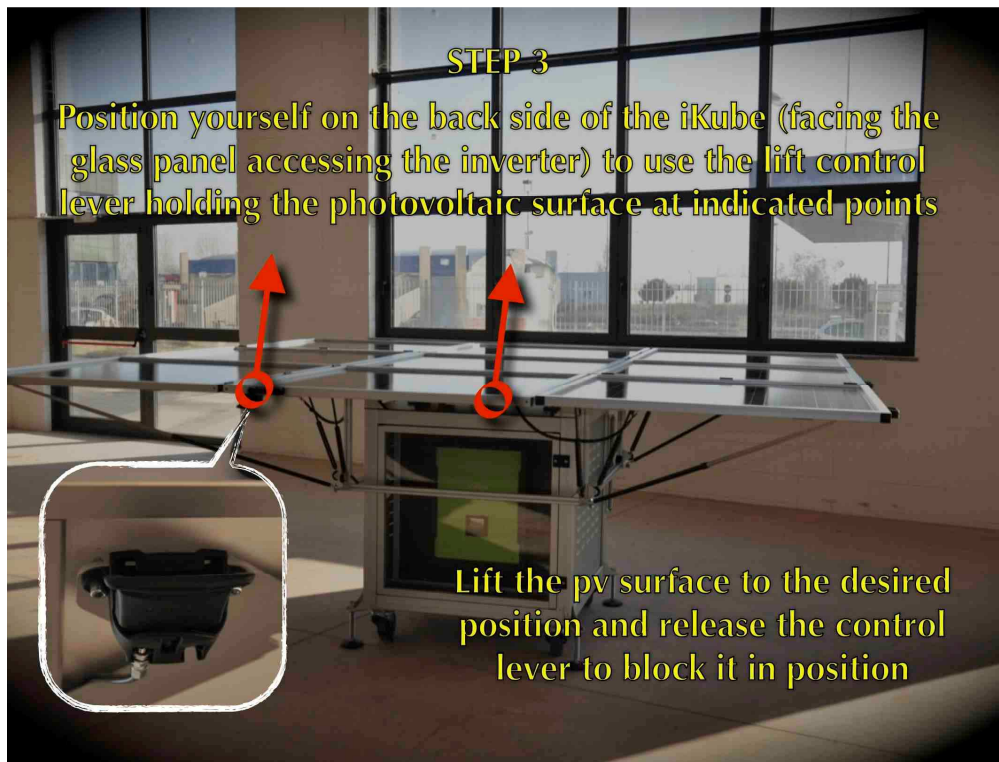
5. Opening

The opening procedure is described by the following images:





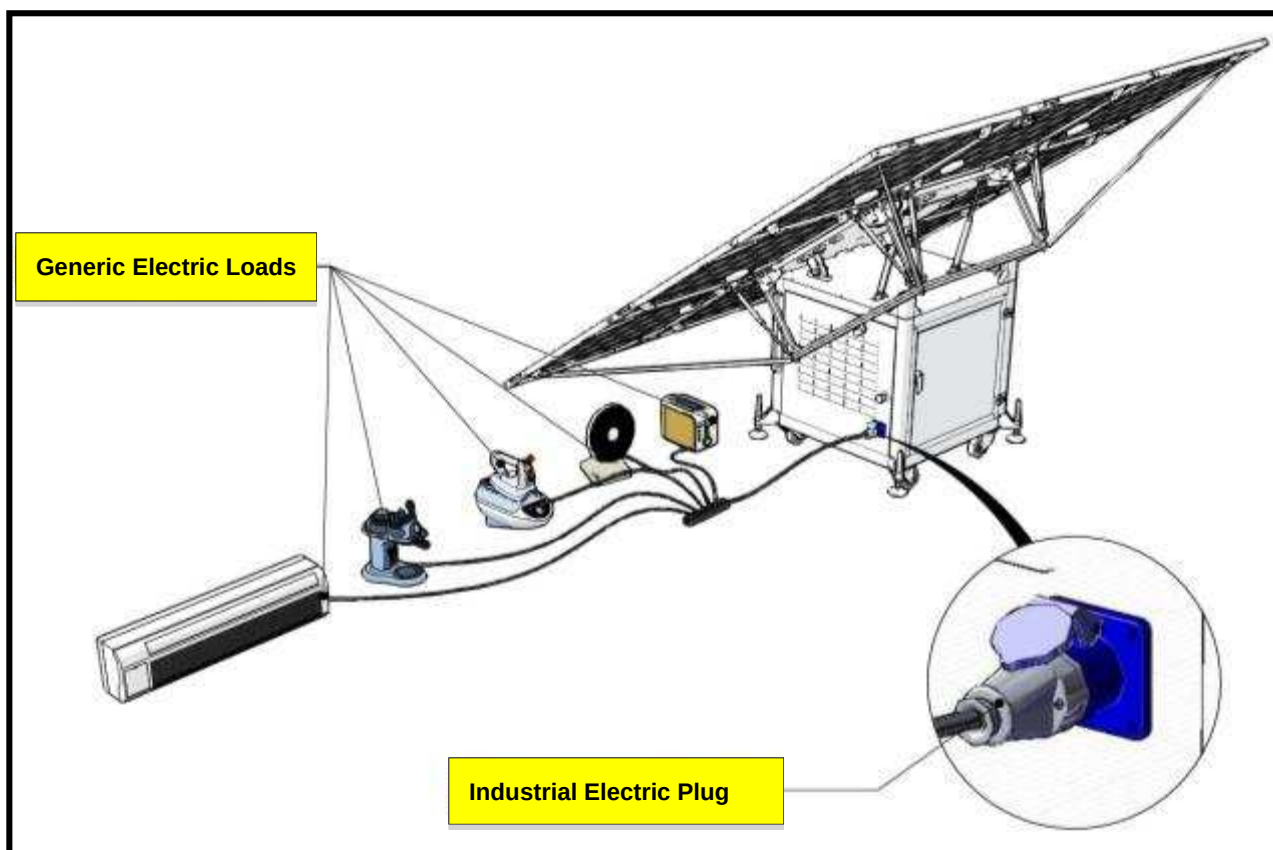




6. Links

WITHOUT THE PRESENCE OF NETWORK CONNECTION:

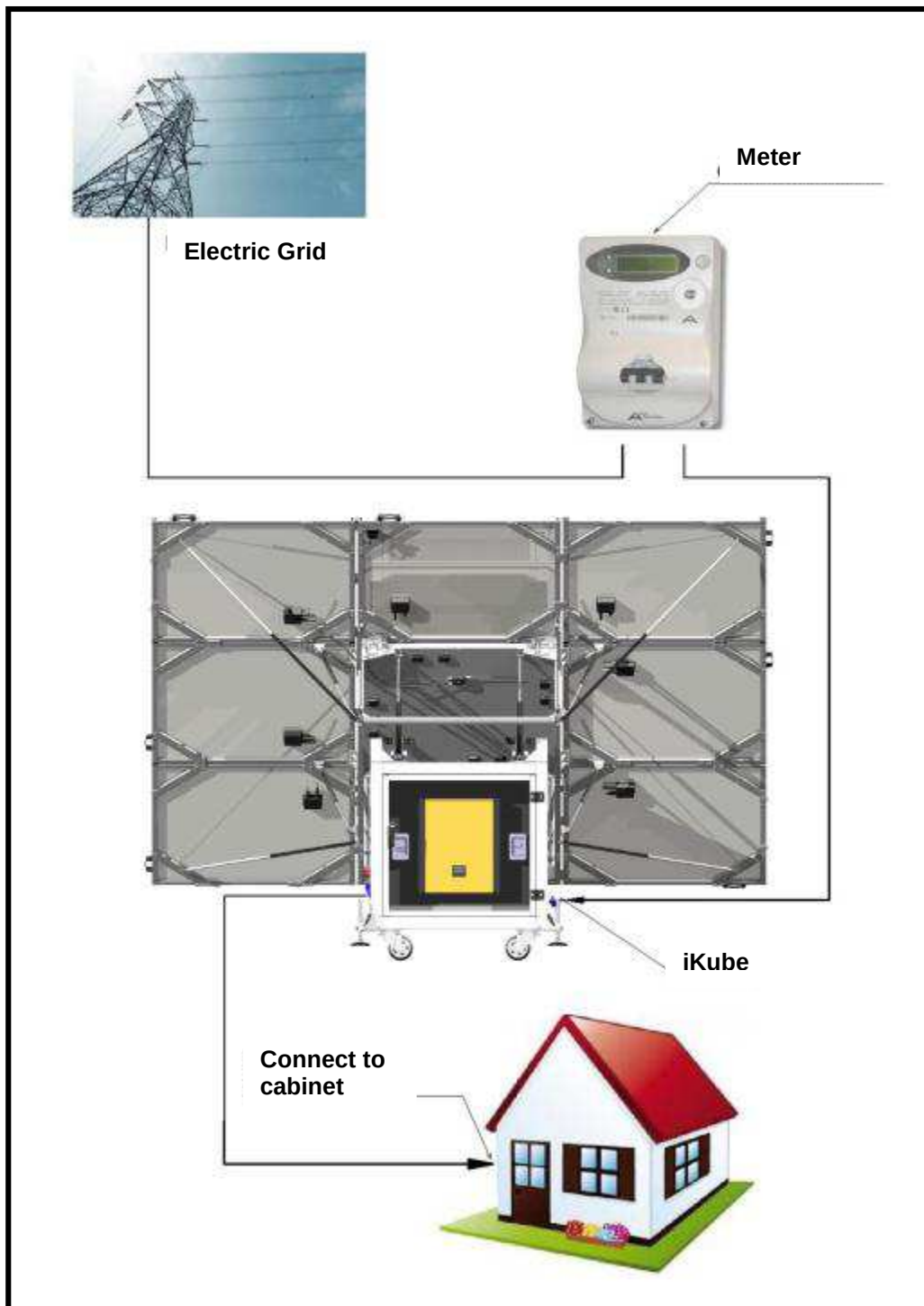
In the connection of electrical loads with an isolated configuration it is sufficient to connect via an outlet industrial 220 V directly to the socket of the machine as shown in Figure



In this situation you do not need grounding if the system is IT type, for details on grounding please read the following chapter.

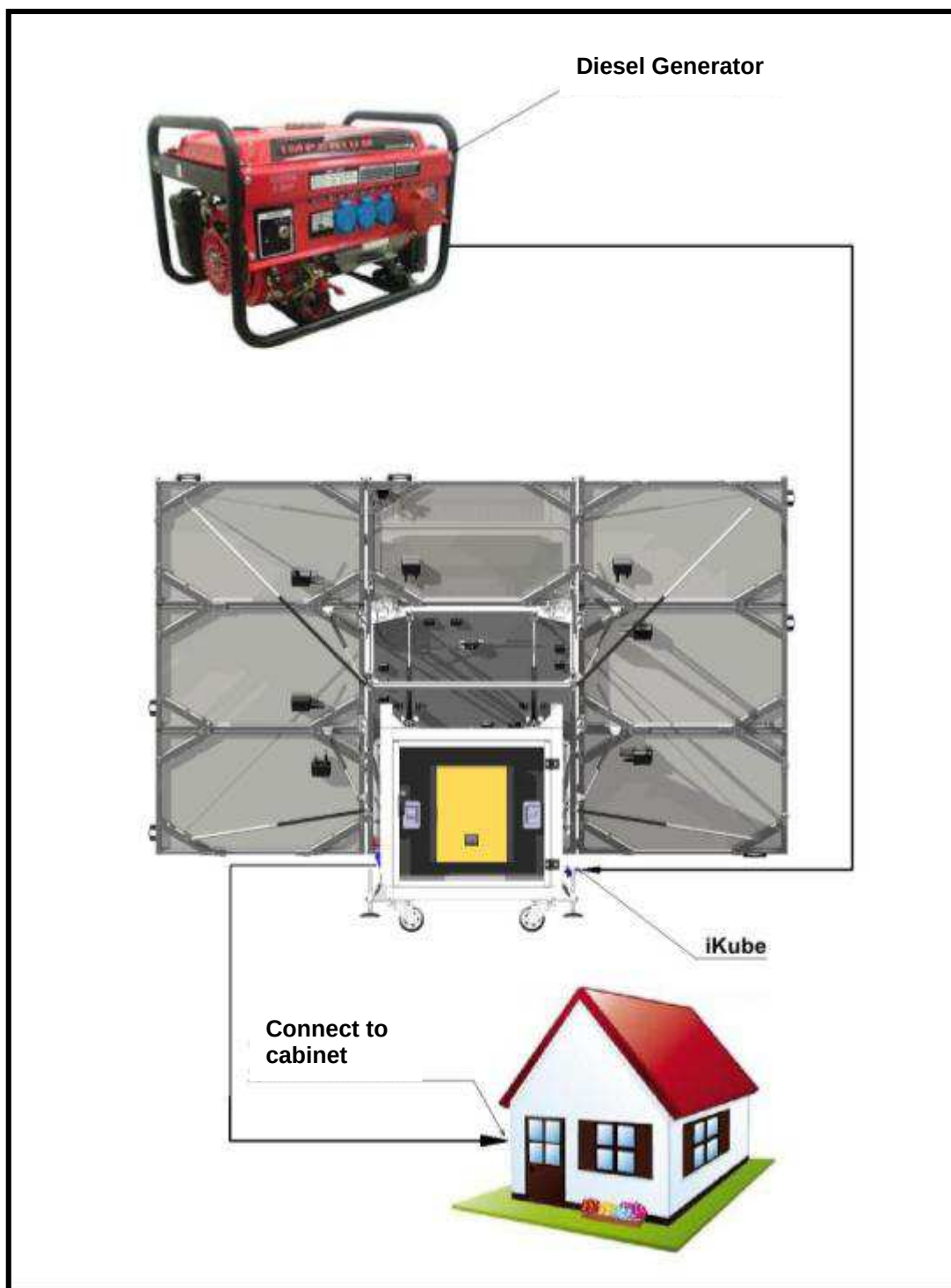
LINKS WITH THE PRESENCE OF NETWORK:

The machinery iKube, in case in there is an electrical network as an auxiliary source, should be interposed between the network and the framework of users according to the scheme indicated, as regards the connection to the ground, see the following paragraph.



CONNECTIONS WITH PRESENCE OF GENERATOR:

The electrical connection with a generator as an auxiliary source is analogous to the connection in the presence of a national network, also in this case for the earth connection, see the following paragraph.



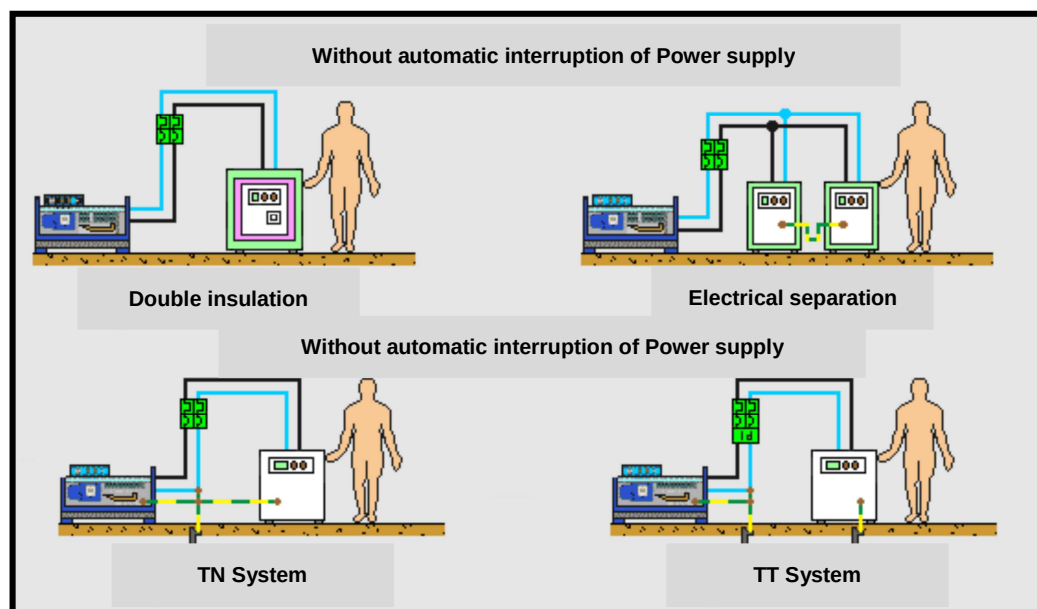
7. Principles of grounding the iKube system

The iKube system can be considered to all effects a generator so as regards the grounding it complies fully with the principles. A technical treatise on grounding of the generators will now follow.

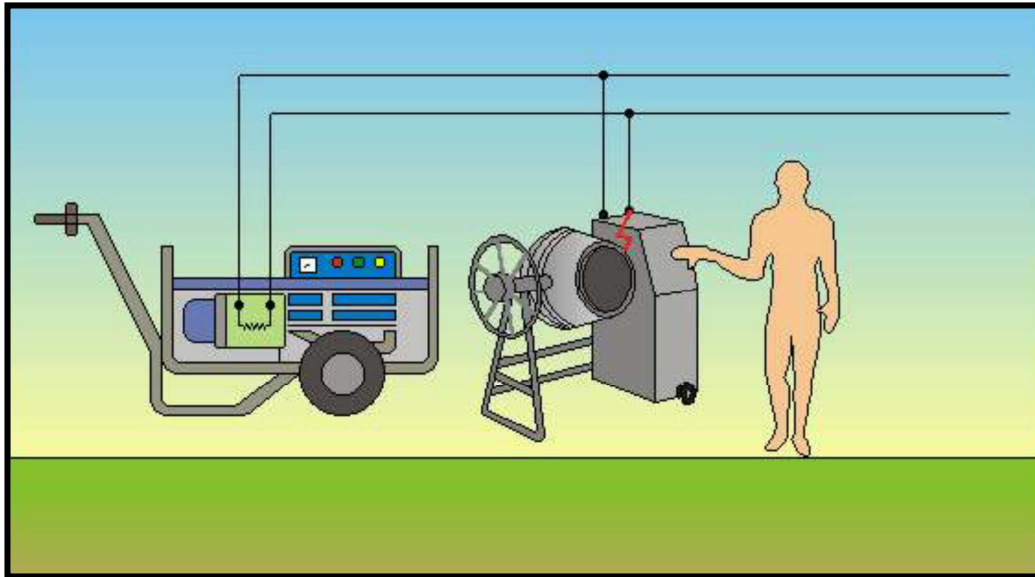
"A generator is a power source consisting of an electric generator driven by an internal combustion engine coupled thereto. The generators can be of fixed, mobile or transportable installation. Serve for the supply of electrical installations, or plant parts, permanent or temporary, and can be connected or not to the public network. The safety of the people to plant powered by the generator, especially for protection against indirect contact, must be addressed taking into account the particular characteristics of these generators.

"When a person comes into contact with a mass or with a metal part in contact with a mass in the presence of a fault the main insulation and there is an indirect contact, instead of a direct contact occurs when it comes into contact with an active part of the facility. Indirect contact is more subtle than directly (protection against direct contact can be made in the insulation of live parts or maintaining an adequate distance) and one can only defend with specific protective systems which may be:

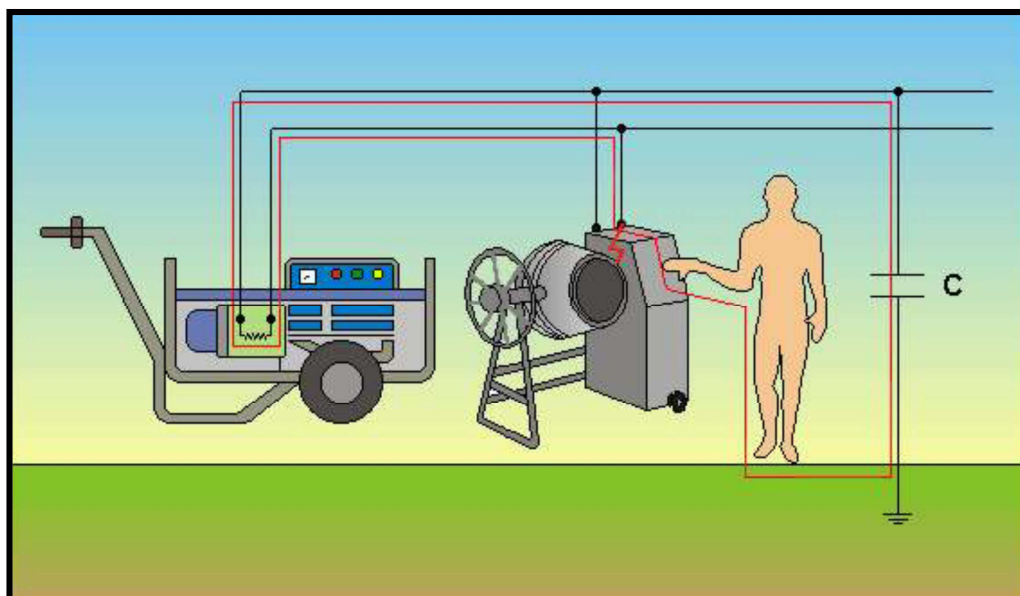
- without automatic disconnection of supply (electrical separation or double insulation);
- with automatic disconnection of supply (TT, TN and IT).



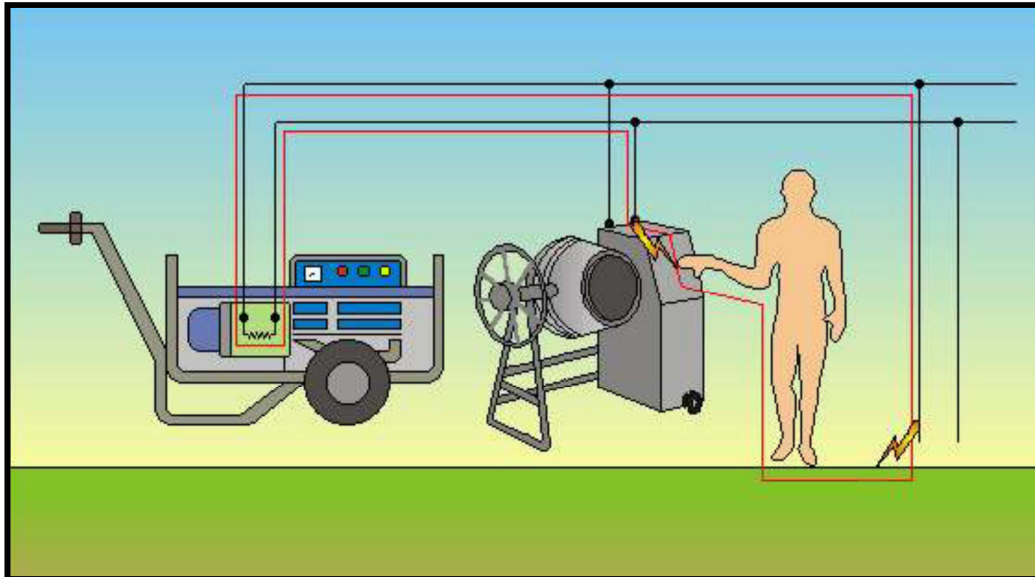
"The protection by electrical separation is well suited to the plants fed by the generator but only if the circuits are too fragmented. The protection is accomplished by isolating from ground the active parts of all power supply circuits. Under these conditions a fault to ground does not involve any danger to the person because the fault current, not being at any point of the separate circuit ground, can not close again towards the ground.



"But it must be negligible ability to ground the wires (Fig.4). The ability to ground depends on the extent of the circuits so, but according to the normal (CEI 64-8 art.413.5.1), must not be of length greater than $100\,000/U_n$ (U_n is the nominal voltage of the separate circuit of not more than 500V) with a maximum of 500 m.

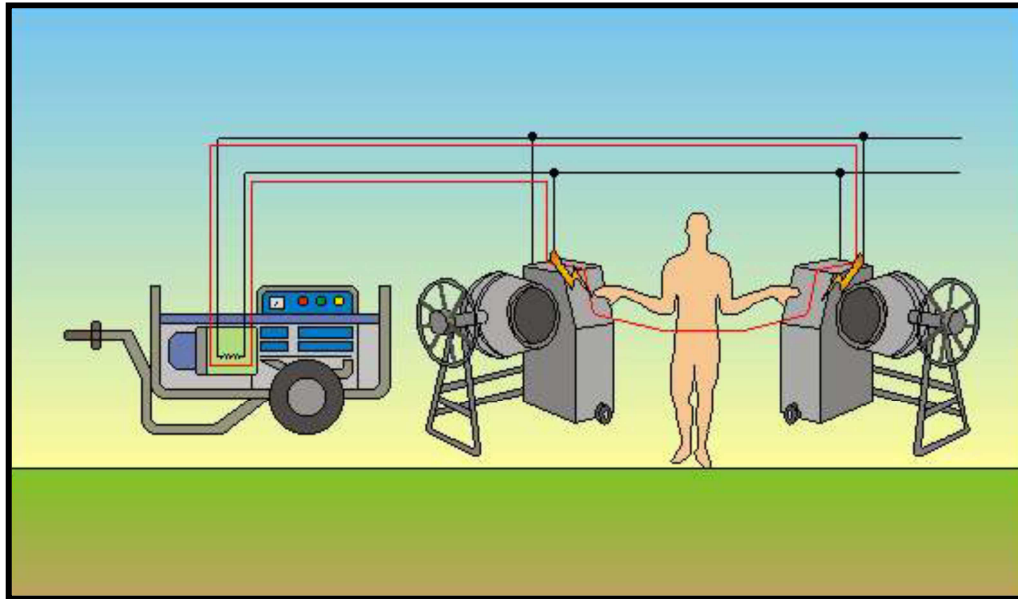


"The extension of the circuits also increases the probability of occurrence of a first earth fault on one pole of the circuit. The occurrence of a second fault to take place on the other pole would make it impossible to protect against indirect contact

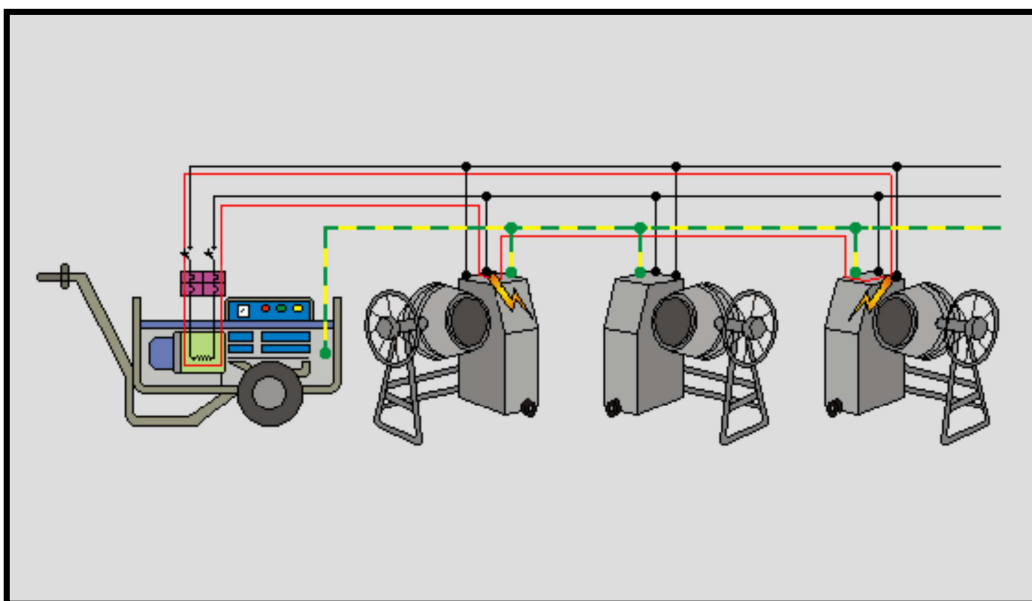


"To limit the risk of earth faults of the separate circuit, you should pay particular attention to the isolation towards the ground, particularly with regard to the flexible cables flying. To check the good condition of the insulation is recommended that the cables are visible (or inspected) over their entire length and mainly in places where the more likely they may suffer mechanical damage. For separate circuits is recommend gone from the norm, the use of separate ducts than the other circuits but is not deemed necessary insulation monitoring device (which is known as is required instead, given the considerable extension of the circuits, in IT systems) as it is considered negligible the likelihood that it occurs in plants of small extension, a first fault to earth (among other things, the masses are isolated from earth and then the fault could not be detected).

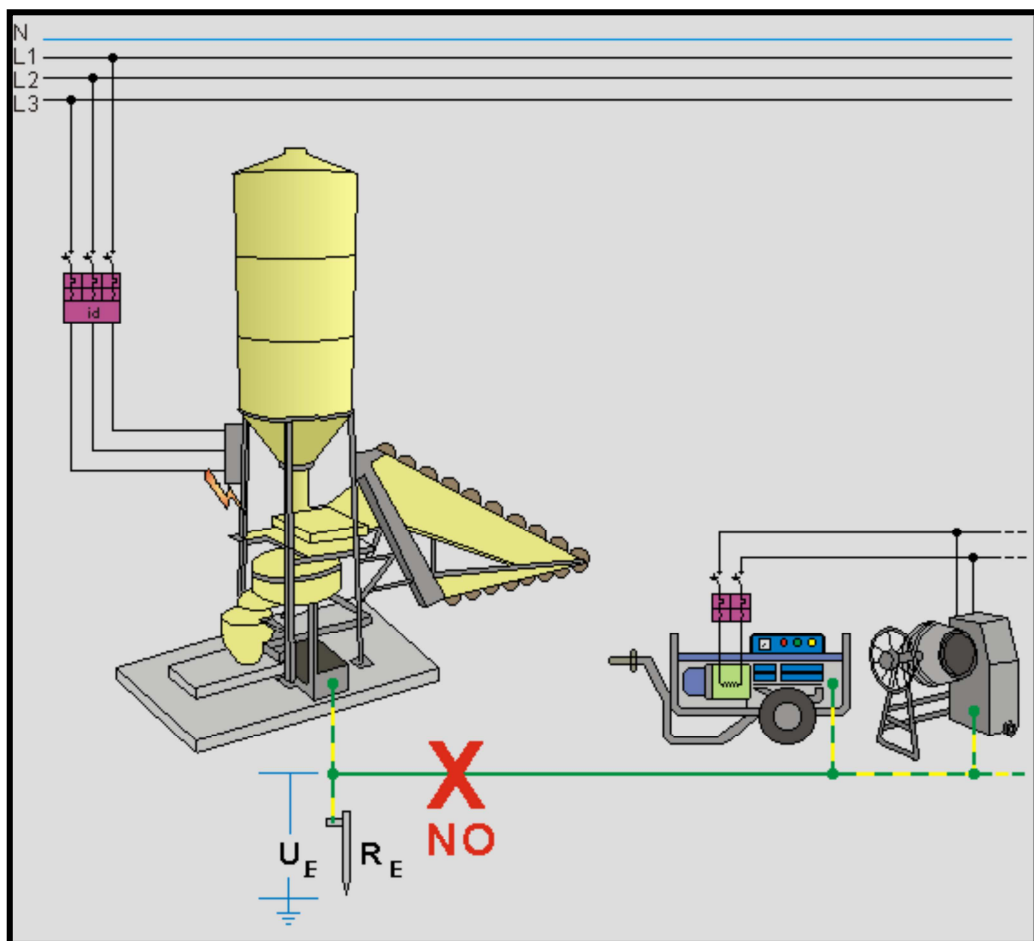
Under the conditions previously set, a first fault to ground on an apparatus could last for an indefinite time without any consequence. If, however, presents another earth fault on a second apparatus, a person in contact with both the equipment would be subject to the passage of a current certainly dangerous.



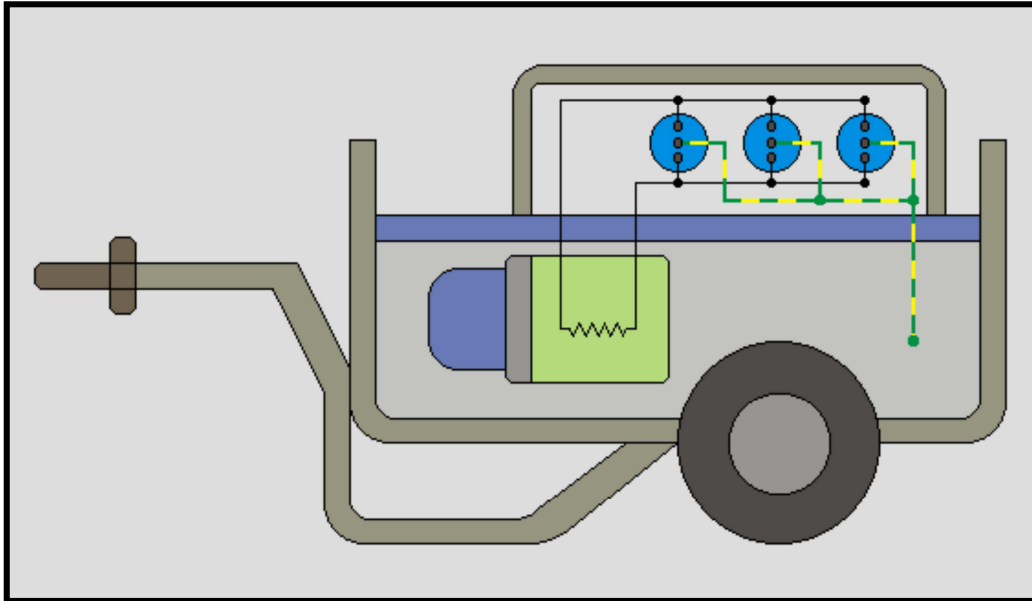
"To solve the security problem just outlined are to be connected in equipotential masses (except for Class II appliances in which any non-metallic enclosure must be connected to potential equalization). The bonding becomes conduct hours twice in a short circuit fault is detected and interrupted by overcurrent protection. To ensure the safety must be verified, however, the timing of protections that coincide with those for TN (CEI 64-8 art.413.5.3.4). For example, to an A of 230 V in the terminal circuits, 0.4 s and 0.2 s under normal conditions under particular conditions.



"In the circuits protected by electrical separation, intentional grounding of the apparatus is unnecessary and in some cases may even increase the hazard. The ground installation, common to other devices connected to the mains, hazardous voltage may in fact introduce the masses. The equipotential must therefore be isolated and not connected to the ground and it should not be connected to protective conductors masses or extraneous to it (separate circuit in the presence of extraneous poses no danger to the person and, moreover, the equipotential would implement the extraneous, albeit indirectly, the ground connection to the masses that needs to be avoided).



If the generator is set up plugged in, the grounded plug must be grounded in the same group so that the class I devices to be linked to the bonding system.



"As we have said intentional connection to the ground in the circuits protected by electrical separation is unnecessary and even contraindicated for safety purposes. The equipment may however be earthed for functional purposes, and not voluntarily, In the usual operation. It is the case of TT, TN and IT systems in normal operation, where it can be adopted to protect electrical isolation for the system part fueled by the generator. The generator can operate in an emergency, but also fuel in normal operation a part of the plant, provided that the extension of separate circuits is limited.

8. Preliminary checks on power

Before putting the machine into operation you must do the following checks:

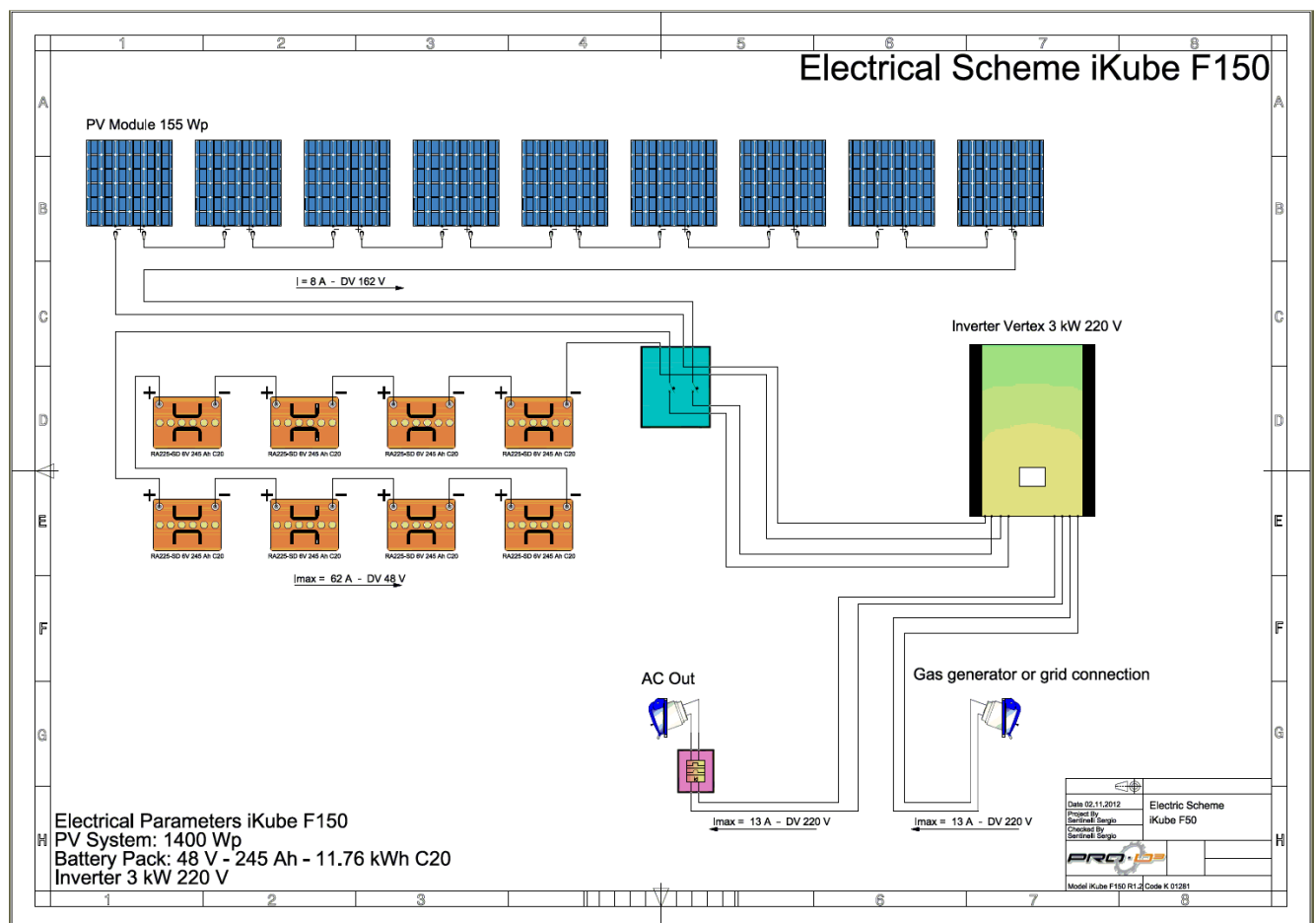
- Control of all security systems;
- Guard control, signage control.
- Check integrity of electrical components, control panels, electrical cables and pipes;
- Control of the exact connection of the external energy source (in case of battery charging from the grid);
- Check the free movement and the eventual free rotation of all the moving parts;

DESCRIPTION OF THE MACHINE

1. Operation principle

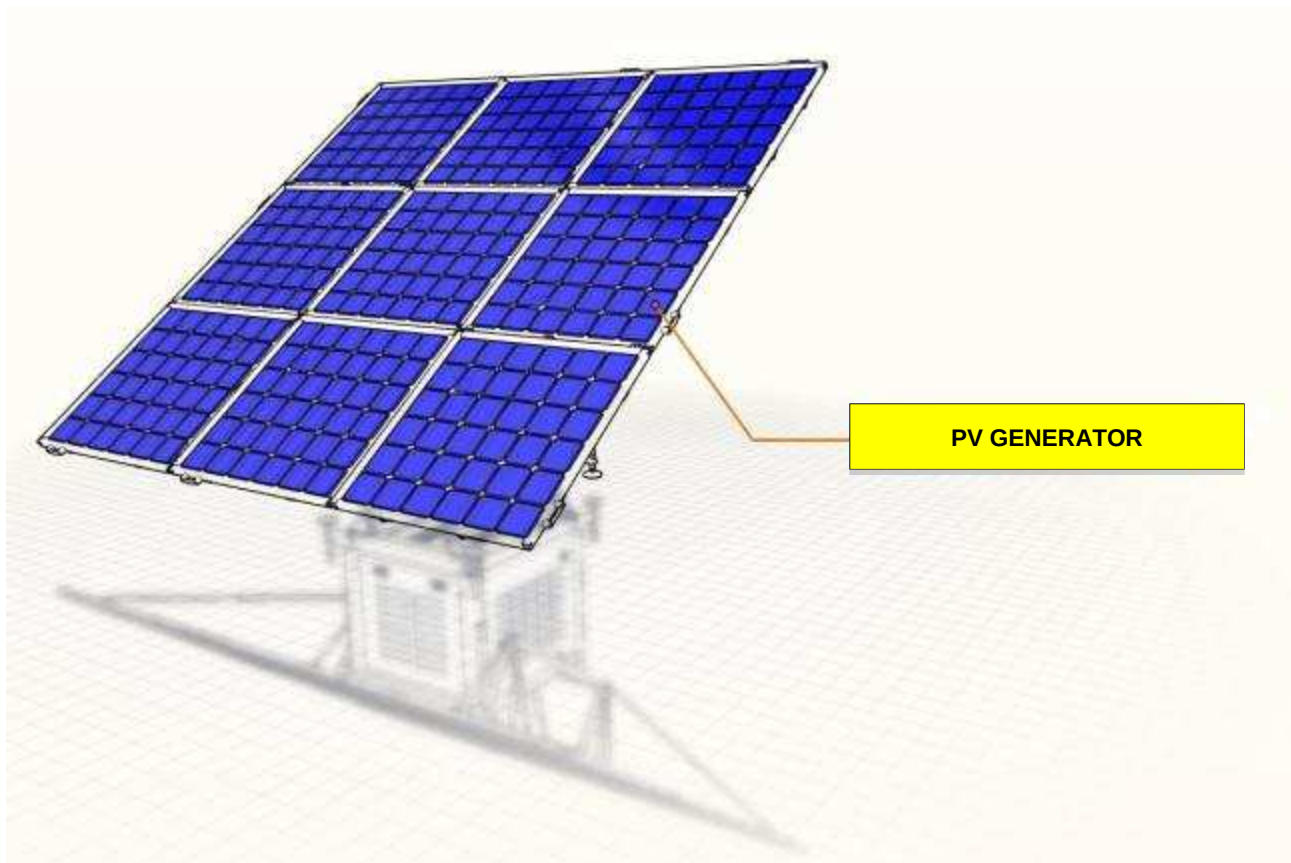
The iKube device was born as an alternative to the common generator powered by fossil fuels. It was designed with the purpose of providing electrical power to the mains voltage of 220 V and 50 Hz

The device generates electricity through a photovoltaic system, such energy can either be directly used for the feeding of the various users or stored in the battery pack to make it a subsequent use in the moments when the sun is not able to supply sufficient power. In case there is an electrical network or an auxiliary generator, it is possible to feed the electric utilities or recharge the batteries from that source, the parameters which determine the input of the auxiliary source can be set in advance according to specific needs.



2. Key Components

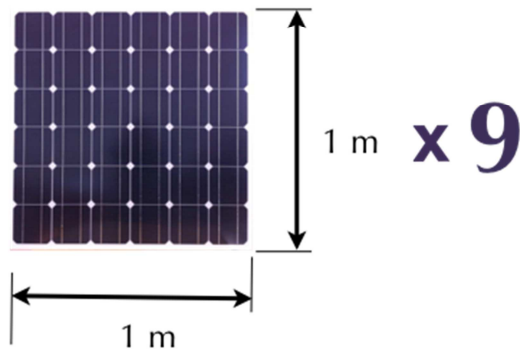
➤ PHOTOVOLTAIC GENERATOR



The photovoltaic generator is composed of 9 photovoltaic modules of 155 Wp each connected in series according to the diagram on page 42, the generator characteristics are as follows:

- **Power:** P 1395 Wp
- **Open Circuit Voltage:** V_{OC} 212.8 V
- **Maximum power voltage:** V_{mp} 170.2 V
- **Short circuit current:** I_{CC} 8.7 A
- **Maximum Power:** I_{mp} 8.2 A

Below is the technical details of each module



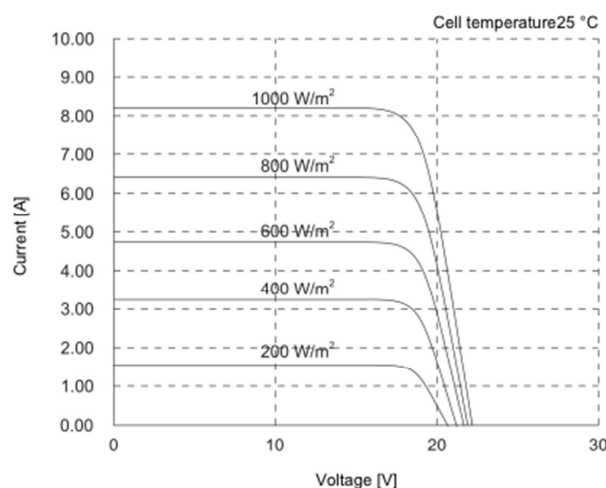
Frameless POLI/MONO
Cristalline silicon PV Modules
are assembled on the iKube
structure.

Technical data

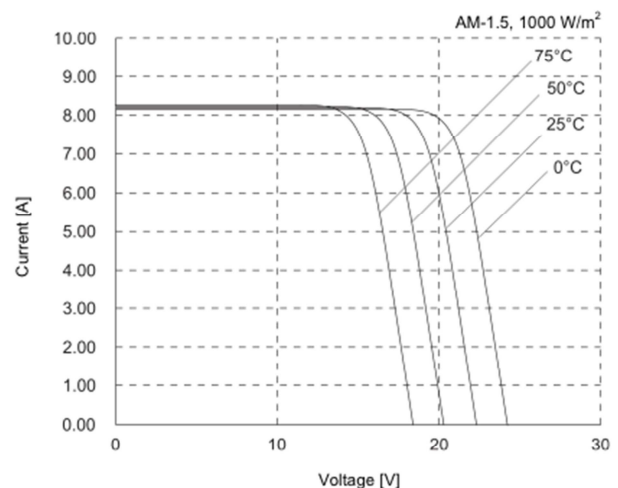
Max power Pmax (W)	155
Max power voltage Vmp (V)	16,54
Max power current Imp (A)	9,37
Open circuit voltage Voc (V)	21,6
Short circuit current Isc (A)	9,98
Min warranted power Pmin (W)	150
Working tolerance (%)	+/- 3%
Max system voltage (V)	1000
Cell efficiency (%)	16,60
Module efficiency (%)	14,00
NOCT (°C)	41,32
Pmax temperature coefficient (%/°C)	-0,43
Voc temperature coefficient (%/°C)	-0,34
Isc temperature coefficient (%/°C)	0,03
Weight (kg)	12

Note 1: Standard conditions. Air mass 1.5,
irradiance 1000 W/m², cell temperature 25 °C.
Note 2: Values indicated are nominal.

Irradiance dependence



Temperature dependence



Guarantees

Product warranty: 12 years (90% of nominal output power)
25 years (80% of nominal output power)
Performance guarantee: 5 years (as per contractual terms)

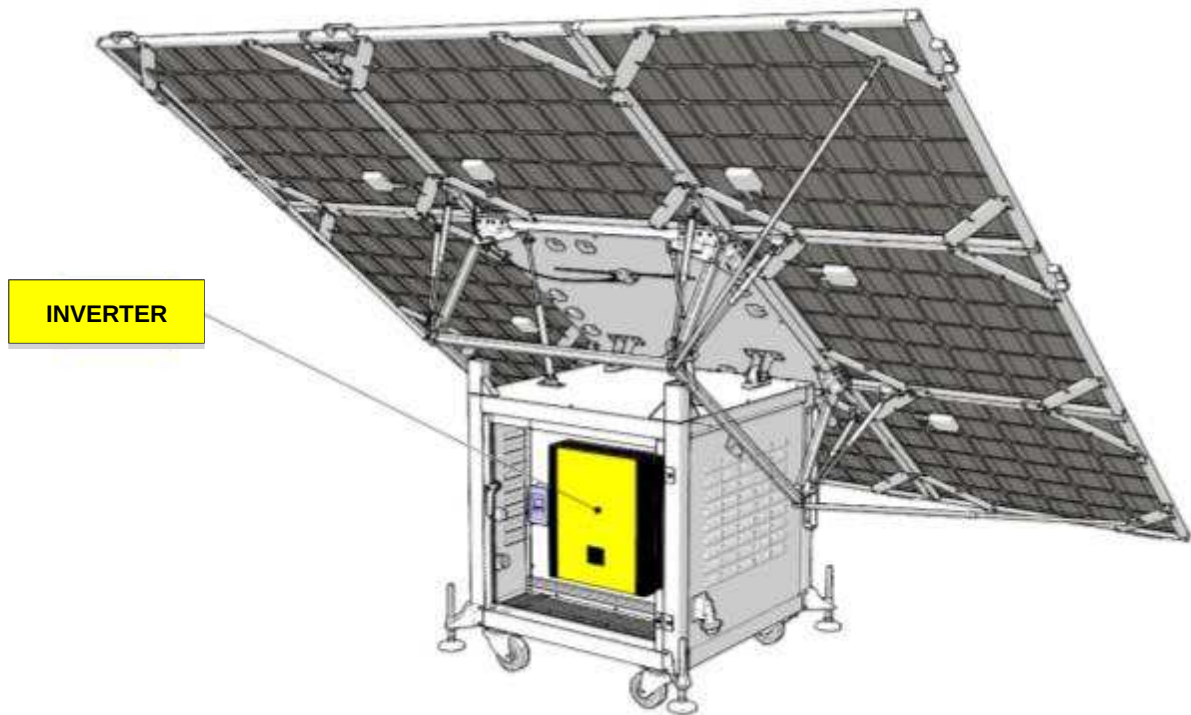


IEC 61215 and
IEC 61730
Certified



EN ISO 9001:2000
Certified Company

➤ INVERTER

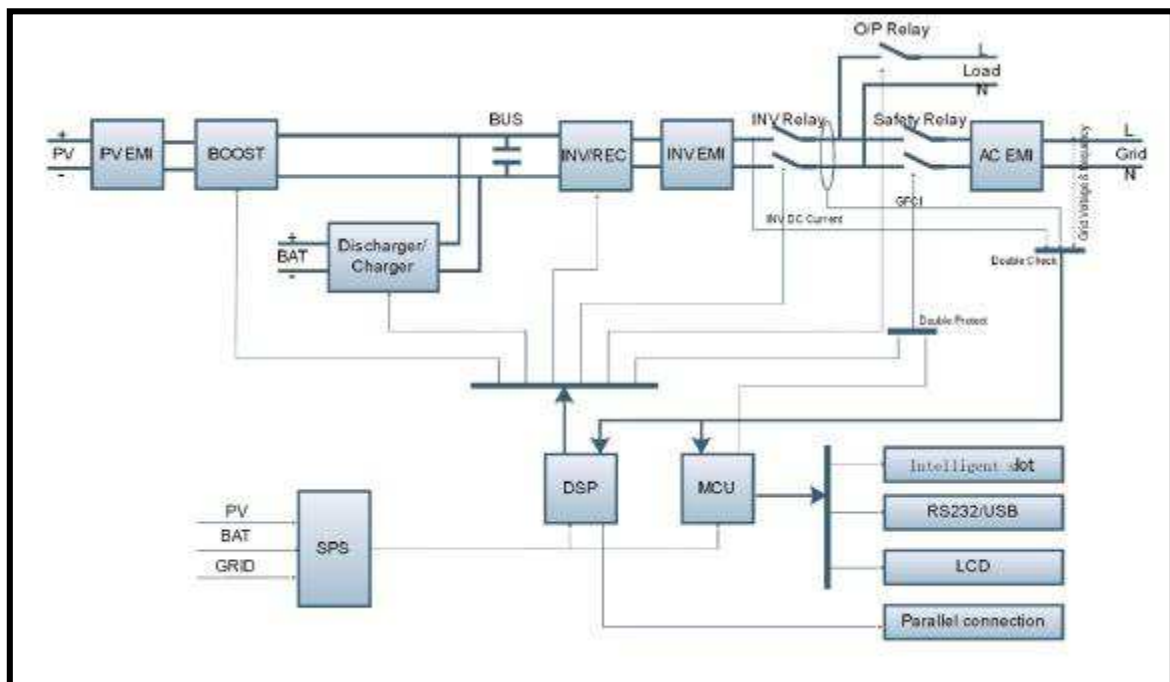


General Features

- **Model:** Vertex 3KW Solar Inverter
- **Manufacturer:** Voltronic Power Technology Corp.
- **Description:** photovoltaic inverters for stand-alone
- **Environment:** The inverter is for indoor and is designed for residential applications of low power
- **Concept of modularity:** In order to reduce the assembly work and increase the reliability, the inverter is designed in a modular form, whose modules are listed below:
 - Form of administration of power from an auxiliary source.
 - Main control module.
 - Module AC / DC conversion.
 - Control module of the charge.
 - Communication Module: RS232, Modbus, SNMP, AS400, GPRS (optional).
- **Characteristics of the PV system:**
 - MPPT works.
 - High efficiency with a high range of operations.
 - Software configuration of internal parameters.
- **Characteristics of the charge:**
 - The charge current can be configured by the user.

- The charging current is regulated by MPPT when the PV system is in operation.
- The PFC increases the efficiency of the charge when the auxiliary source is operating.
- There are three charging stages: Bulk, Absorption, Floating.
- The battery pack is protected against overcharging and deep discharge.

Block diagram



Reference Standards

- **EMC:** EN 61000-6-4, EN 61000-6-2
- **Interference Network:** VDE 0126-1-1
- **Low Voltage Directive:** EN 60950

Electrical specifications, performance guarantees

- **AC input**
 - **Power Voltage:** 120 ~ 140 V_{ac}
 - **Reignition voltage:** 185 Vac ± 3%
 - **Range of input voltage:** 175 ~ 280 V_{ac}
 - **Frequency range:** 47.5 ~ 52.5 H_z
 - **Maximum input current:** 20 A

➤ PV Input

- **Maximum DC output:** 3200 Wp
- **Maximum input voltage:** 500 V_{dc}
- **MPPT operating range:** 100 ~ 450 V_{dc}
- **Range:** 100 ~ 500 V_{dc}
- **Maximum input current:** 13 A

➤ Overload Capacity

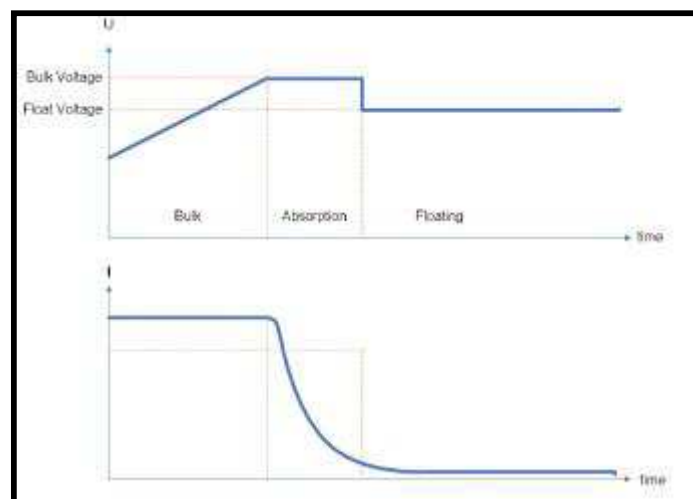
- **> 110%:** 5 minutes
- **> 150%:** 1 minute
- **> 200%:** 0.1 seconds

➤ Batteries

- **Rated voltage:** 48 V_{dc}
- **Power Voltage:** 44 V_{dc}
- **Voltage of power failure:** 42 V_{dc}

➤ Charge Controller

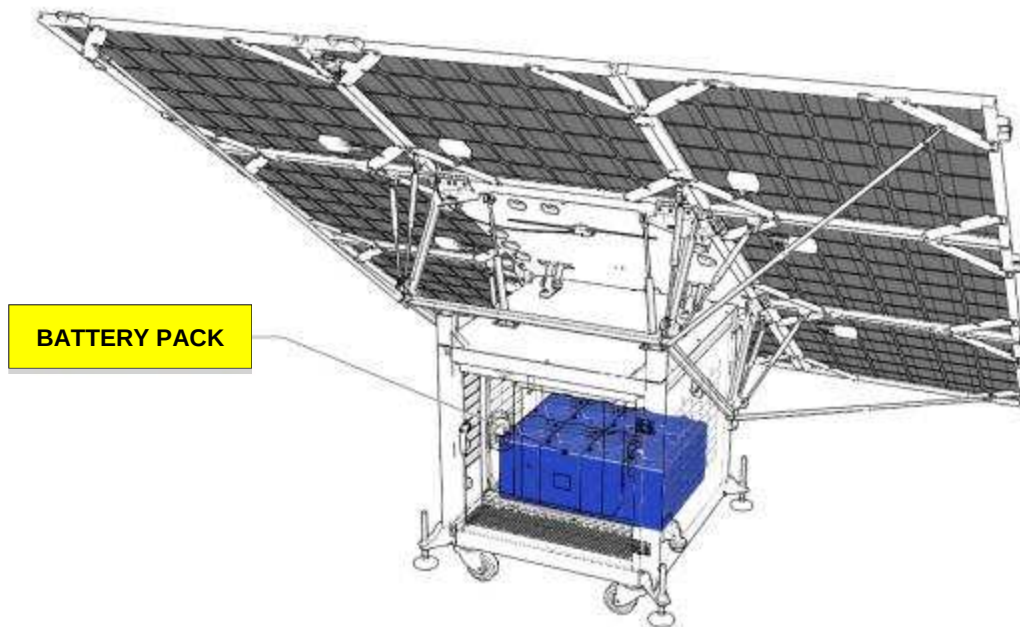
- **Maximum charge current:** 25 A
- **Voltage booster phase Absorption:** 57 V_{dc}
- **Floating voltage ignition phase:** 55 V_{dc}
- **Voltage overload protection:** 59 V_{dc}



➤ Environmental conditions

- **Storage Temperature:** -15 ° to 60 °
- **Operating temperature:** 0 ° to 40 °
- **Storage humidity:** 0% to 95%
- **Humidity range:** 0% to 90%

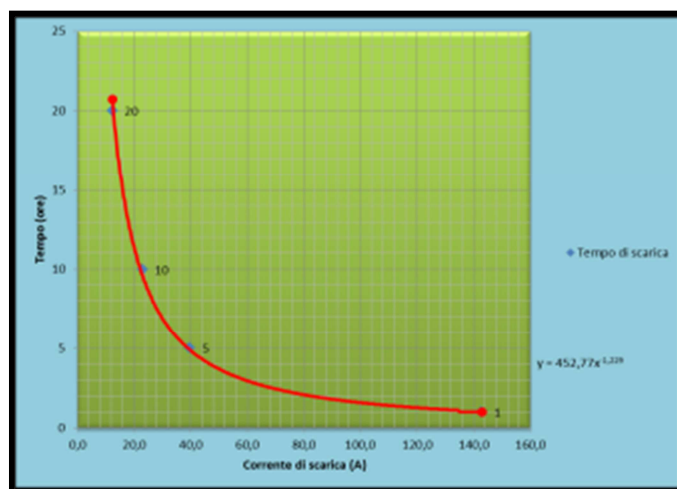
➤ BATTERIES



The battery pack is made up of 8 Ritar Power RA 225SD batteries placed in series according to the diagram on page 42.

➤ Characteristics of the battery pack

- Rated voltage: 48V
- C_{10} Capacity: 225 Ah
- C_{20} capacity: 245 Ah
- Energy can be delivered C_{10} : 10.8 kWh
- Energy can be delivered C_{20} : 11.7 kWh
- Weight: 256 kg



Characteristic of battery discharge



RA6-225SD (6V225Ah)

RA6-225SD is AGM Deep cycle battery with 10 years floating design life, specially designed for frequent cyclic discharge usage. By using strong grid and specific paste plate, it makes battery have 30% more cyclic life time than standby series. It is applicable for solar energy system, golf cart, electric wheelchair, etc...



Specification

Cells Per Unit	3
Voltage Per Unit	6
Capacity	225Ah@10hr-rate to 1.80V per cell @25°C
Weight	Approx. 32.0 Kg
Max. Discharge Current	2250 A (5 sec)
Internal Resistance	Approx. 4.0 mΩ
Operating Temperature Range	Discharge: -20°C~60°C Charge: 0°C~50°C Storage: -20°C~60°C
Normal Operating Temperature Range	25°C ± 5°C
Float Charging Voltage	6.8 to 6.9 VDC/unit Average at 25°C
Recommended Maximum Charging Current Limit	67.5A
Equalization and Cycle Service	7.3 to 7.4 VDC/unit Average at 25°C
Self Discharge	RITAR Valve Regulated Lead Acid (VRLA) batteries can be stored for more than 6 months at 25°C. Self-discharge ratio less than 3% per month at 25°C. Please charge batteries before using.
Terminal	Terminal F14
Container Material	A.B.S. (UL94-HB), Flammability resistance of UL94-V1 can be available upon request.



MR25539



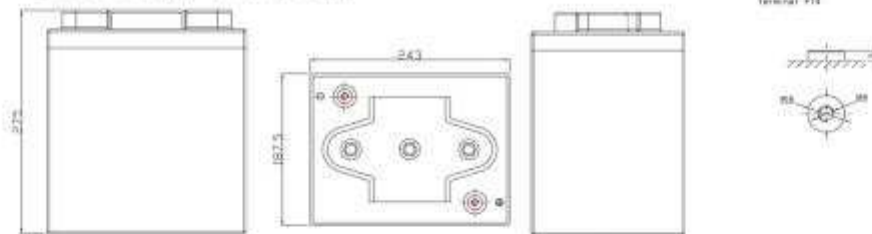
Q/M225SDM-RA6S-E-18



ISO9001:2000 Certificate

Dimensions

Unit: mm Dimension: 243 (L) × 187.5 (W) × 275 (H)



Constant Current Discharge Characteristics: A (25°C)

F.V/Time	5MIN	10MIN	15MIN	30MIN	1HR	2HR	3HR	4HR	5HR	8HR	10HR	20HR
4.80V	613.3	459.4	387.8	248.4	146.3	87.51	60.49	49.57	40.58	27.95	23.63	13.00
5.00V	595.5	437.1	379.8	244.3	145.6	86.85	60.26	49.34	40.34	27.72	23.40	12.76
5.10V	577.9	421.7	373.9	242.2	144.2	86.20	59.79	49.11	40.10	27.49	23.18	12.52
5.25V	518.9	389.1	356.0	236.1	142.9	85.54	59.56	48.65	39.62	27.27	22.95	12.29
5.40V	468.4	354.8	328.1	225.7	139.5	84.00	57.94	47.51	38.90	26.81	22.72	12.05
5.55V	399.9	317.1	294.3	211.5	132.5	80.27	55.39	45.21	37.23	25.68	22.04	11.34

Constant Power Discharge Characteristics: W (25°C)

F.V/Time	5MIN	10MIN	15MIN	30MIN	1HR	2HR	3HR	4HR	5HR	8HR	10HR	20HR
4.80V	3172	2446	2133	1416	845.0	515.7	359.9	295.4	242.0	166.9	141.2	77.92
5.00V	3109	2371	2099	1399	843.0	513.0	360.0	295.1	241.4	166.1	140.3	76.57
5.10V	3074	2309	2075	1389	836.5	509.9	358.5	294.4	240.6	165.0	139.1	75.15
5.25V	2798	2150	1979	1356	828.9	506.2	357.1	291.7	237.7	163.6	137.7	73.73
5.40V	2548	1982	1829	1300	813.6	499.8	347.3	285.0	233.4	160.9	136.3	72.31
5.55V	2238	1792	1647	1221	778.8	481.2	332.3	271.3	223.4	154.1	132.2	68.06

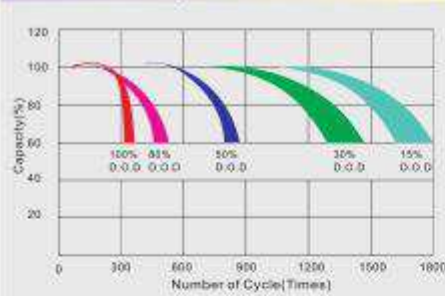
All mentioned values are average values.

RA6-225SD

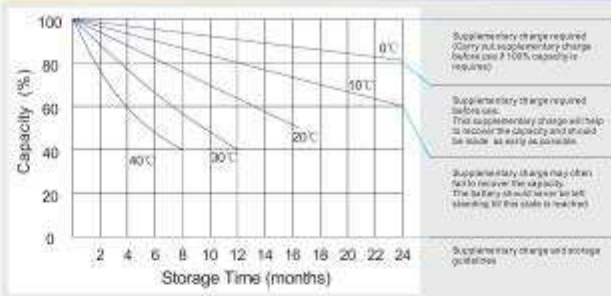
6V225Ah



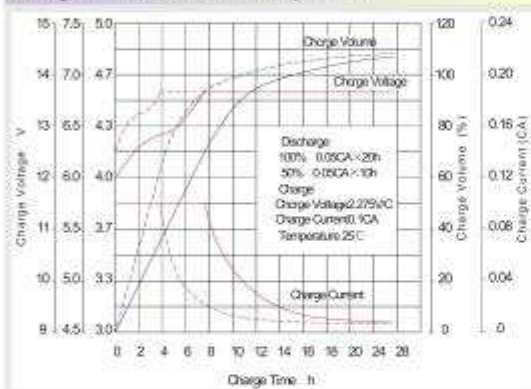
Life characteristics of cyclic use



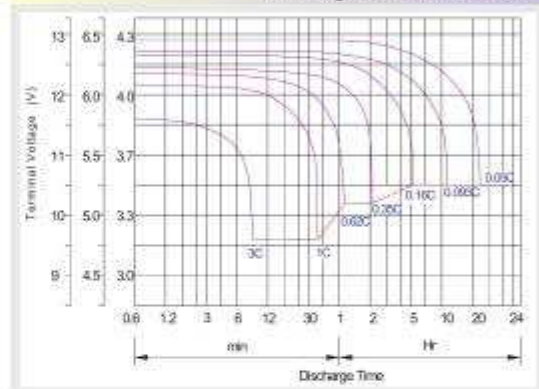
Storage characteristic



Charge characteristic curve for cyclic use



Discharge characteristic curve



Capacity Factors With Different Temperature

Battery Type		-20℃	-10℃	0℃	5℃	10℃	20℃	25℃	30℃	40℃	45℃
GEL Battery	6V&12V	50%	70%	83%	85%	90%	98%	100%	102%	104%	105%
	2V	60%	75%	85%	88%	92%	99%	100%	103%	105%	106%
AGM Battery	6V&12V	46%	66%	76%	83%	90%	98%	100%	103%	107%	109%
	2V	55%	70%	80%	85%	92%	99%	100%	104%	108%	110%

Discharge Current VS. Discharge Voltage

Final Discharge Voltage V/cell	1.75V	1.70V	1.60V
Discharge Current (A)	A 0.2C	0.2C A 1.0C	A 1.0C

Maintenance & Cautions

Cycle service

- ❖ Avoid battery over discharge, especially battery series connection use.
- ❖ Charged with recommend voltage, ensure battery can be full recharged.
- In general, recharge capacity should be 1.1-1.15 times discharge capacity.
- ❖ Effect of temperature on cycle charge voltage: -4mV/℃/Cell.
- ❖ There are a number of factors that will affect the length of cyclic service.
- The most significant are depth of discharge, ambient temperature, discharge rate, and the manner in which the battery is recharged.
- Generally speaking, the most important factors is depth of discharge.

Charge the batteries at least once every six months, if they are stored at 25°C.

Charging Method:

Constant Voltage	-0.2Cx2h+2.4-2.45V/Cellx24h, Max. Current 0.3CA
Constant Current	-0.2Cx2h+0.1CAx12h
Fast	-0.2Cx2h+0.3CAx4.0h

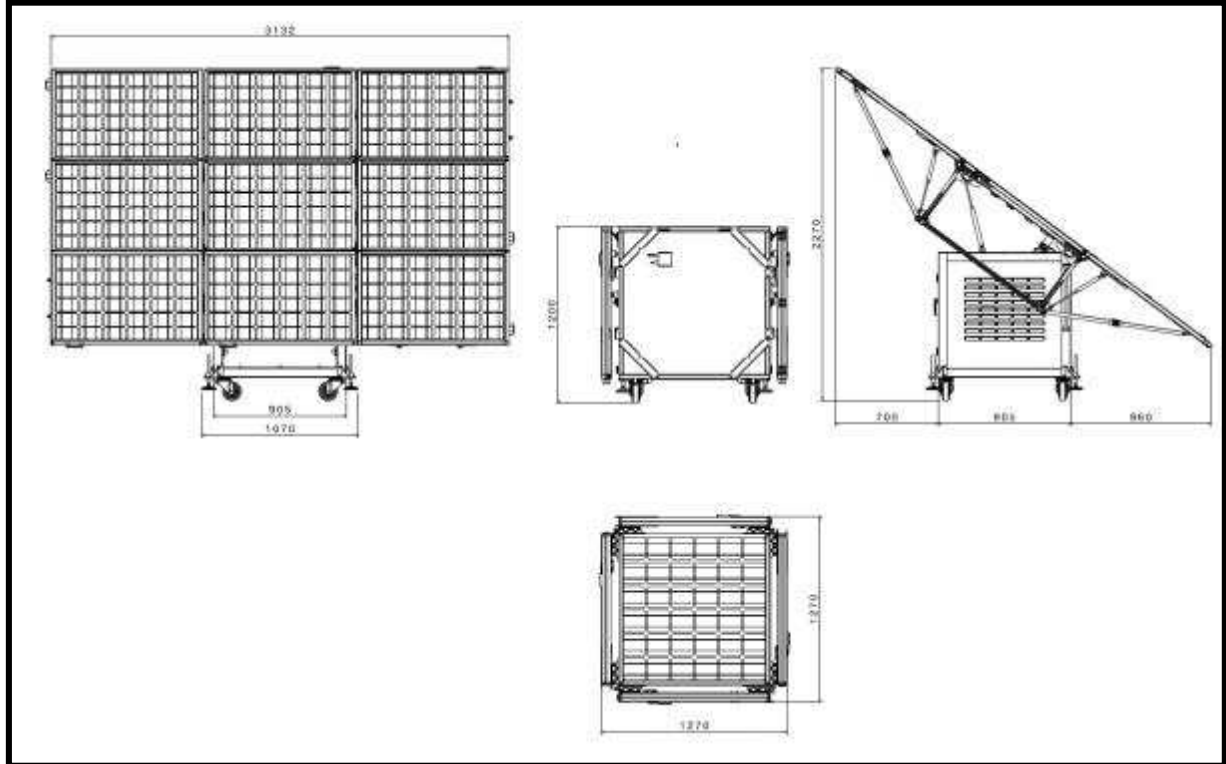
SHEN ZHEN RITAR POWER CO.,LTD.

URL: www.ritarpower.com

Address: Rm405, Tower C, Hushan Building, Langshan Rd16, Nanshan District, ShenZhen, 518057, China
Tel: +86-755-33981668 Fax: +86-755-3347-5180

2011 - Revision 1

3. Size



4. Vibration

During the characterization and testing, vibrations were not detected. In conditions when use meets the guidelines of proper use, the iKube machine does not emit vibrations. In particular there is no transmission of vibration neither on whole body nor the hand-arm system.

5. Emission of sound

The only noise emissions are those produced by the inverter. In particular, the noise of cooling fans can be noticed, the noise increases, by a very low amplitude, in the case it is feeding a high load. However, even in this case, the noise does not exceed that of a normal PC.

It is also possible to note the intermittent sound warning, in the case the panel is disconnected from the system, disconnecting condition applicable via the parcel fuses mounted to the left of the inverter. This sound can be disabled by pressing *DOWN*.

The equivalent continuous sound pressure level weighted and C-weighted instantaneous sound pressure jobs is not likely to cause danger to personnel. From sound level measurements made during the test runs against the machine, is:

- Sound pressure level: 72.7 ± 0.5 dB (A).

NOTE: The sound level measurements were made with a suitable tool Ohm Delta 2010 sound level meter class 1 regularly calibrated.



In case of professional use, the employer must still make or integrate the noise risk assessment to take into account the occupational exposure of workers, in accordance with the provisions of the regulations in the country of use.

6. Standard delivery

The machine is supplied complete commissioning.

A kit is provided with:

- Instruction Manual for the use and maintenance (IMUM).
- User manual of the inverter.
- Test certificate.
- Plaque affixed with CE marking.
- Key for 22 feet
- Key holder inverter

7. Electromagnetic Environment

The machine is designed to operate properly in an electromagnetic environment for domestic and / or industrial, on-Emission limits and immunity provided by the following harmonized standards:

- CEI EN 61000-4 electromagnetic compatibility (EMC): Immunity to interference from the environment
- CEI EN 55011 Electromagnetic compatibility (EMC) Emission of conducted and radiated in the frequency range 30 MHz - 1 GHz

USING THE MACHINE

1. Console

....The control panel of the iKube coincides with the control panel of the inverter (for more detailed information if they see the user manual of the inverter). Such booklet is provided with four keys that allow navigation between the various operating parameters.



PARAMETERS:

- **AC input:** Displays voltage and frequency for the power supply by mains supply or generator.
- **AC OUTPUT:** Display power, voltage and frequency of the applied electric loads.
- **PV INPUT:** Displays power and voltage of the photovoltaic generator.
- **BATTERY CAPACITY:** Displays the battery status in percentage or voltage.
- **CHARGING CURRENT:** Displays the battery charge current from an auxiliary source.
- **ENERGY GENERATED:** Displays the total energy that is generated daily.

The control panel also displays the direction of energy flow between devices such as photovoltaic generator, battery pack, utilities and energy source.

2. Commissioning

For the "Start function" is necessary that there is one source of power among the three available:

1. Photovoltaic generator
2. Battery Pack
3. Auxiliary source

If at least source 1 or 3 is present, the inverter turns on, if there is only the battery pack, it is necessary to turn the inverter on using the appropriate switch. For correct operation make sure the load icon is enabled:



Otherwise hold the ON button for about 4 seconds and wait for the trigger relay enable loading and the consequent appearance of the icon. After performing the above operations proceed as follows:

- Carefully visually inspect the entire machine and make sure there are no persons or materials that may be in the area of normal operation, or objects inadvertently left on it or inside it;
- Verify that the red release button is enabled;
- Check that the doors to protect the battery and inverter are closed;



1. Normal Stop

The button "Normal Shutdown" is present on the control of the inverter: simply press the OFF button. To disconnect the machine must also act on the RCBO switch, located on the left side of the inverter.



5. Emergency Stop

The operation of Emergency Stopping the machine is done by pressing the red "Emergency" mushroom button, this action causes the immediate interruption of electricity on the machine. The button is on the side panel of the machine.



6. Restoration

The unit can be reset by turning its emergency mushroom button counterclockwise and closing the differential circuit breaker. At this point you press the ON button on the inverter in the event that it had been voluntarily switched off.



7. Decommissioning

During long periods of inactivity, you must disconnect the power from the inverter control panel and open the differential circuit breaker ..Finally, we recommend storing in an enclosed area not subject to moisture, covered with a sheet of appropriate size.



MAINTENANCE

1. State of maintenance

Maintenance operations must be performed with the machine under the conditions described under "STATE OF THE MACHINE" in the Maintenance Program Table.



2. Isolation of the machine

Before attempting any maintenance or repair, it is necessary to isolate the machine from the power supply. The energy sources present on the machine: electricity. To isolate the machinery, it is necessary to push on the button panel of the inverter OFF and then open the differential circuit breaker, located on the left side of the inverter, then isolate the generator by opening the switch on the right side of the inverter.

Special Precautions

When performing maintenance or repair work, you should do as described below:

- Do not use solvents or flammable materials;
- Be careful not to dump materials in the environment like the batteries or components of the machine no longer be used, such as the batteries, switches, cables, etc.;
- Do not climb on photovoltaic panels, because they were not designed to support people;
- At the end of the work, repair, and properly secure all shields and guards removed or open.

4. Cleaning

Do this by isolating the equipment from energy sources. The cleaning is done using vacuum cleaners and rags of any material, slightly soaked in detergents.

NB you may not use paper cleaning towels as they leave residues.



5. Lubrication

The machine is not subject to scheduled lubrication. However it may be necessary to periodically lubricate lightly with common fat the support pins and sail handling PV.



6. Routine maintenance

General requirements:

1. Check once a month, the operation of the emergency button and breaker present, empty the machine running and proving the correct action (suspension of operation) of these devices. In case of failure, trust the search for the problem only to specialists, or call technical support from the manufacturer of the machine.

The machine is designed to minimize maintenance, it is up to the operator to judge the condition and its suitability for use.

It is recommended to stop and to intervene with maintenance every time you hear a less than optimal functioning, it will always have the highest efficiency.

2. Visually check the status of the individual parts that compose the machine, verifying that there is no deterioration due to failure or deformation

**WARNING!**

Before any maintenance, the maintainer must exclude the power OFF the inverter by pressing the button, opening the circuit breaker and then pressing the emergency button, while ensuring that there are no electrical connections with the network or potential users.

Always use the appropriate PPE Personal Protective Equipment:

- Gloves for protection against electrical hazards when working on batteries;
- Safety goggles when operating on batteries;
- Suitable clothing.

Scheduled maintenance

The operations described below, are to be executed with the timing indicated

N.B.



Failure to comply with the requirements, exempts the manufacturer from any liability to the effects of the warranty.

Such operations, though simple, must be performed by qualified personnel.

The regular scheduled maintenance, including inspections, audits and interventions to prevent stops and breakdowns.



Maintenance Schedule Table:

N°	CODE	DESCRIPTION	DESCRIPTION OF PROCEDURE	Specializations	STATE OF THE MACHINE	FREQUENCY
1	01.01	Static structure - frame	Check integrity and no deformation	Mechanical Maintenance		1 year
2	01.02	Static structure - feet for supporting and positioning iKube	Check integrity and no deformation	Mechanical Maintenance		6 months
3	01.03	Static structure - Closing frame panels	Integrity and no deformation occurs, verify proper closure panels	Mechanical Maintenance		6 months
4	01.04	Static structure - moving wheels iKube	Check functionality and wear of the wheels. Replace them if necessary	Mechanical Maintenance		6 months
5	02.01	Sailing Photovoltaic - PV	Check integrity of panels and electrical connections	Electrical Maintenance		6 months
6	02.01	Sailing Photovoltaic - PV	Clean solar panels	Operator		1 months
7	02.02	Support System, A / C solar sail	Check integrity of pins and support system	Mechanical Maintenance		6 months
8	02.02.01	A pneumatic piston / C solar sail	Verify correct functionality pistons and seals, possibly recharge the pistons	Mechanical Maintenance		6 months
8	03.02	Electrical components - Drives	Clean inverter	Electrical Maintenance		3 months
10	03.03	Thermoswitch	Test run	Operator		1 months
11	03.04	Electrical components - battery pack	Check power cables are correctly tightened	Electrical Maintenance		6 months

7. Extraordinary maintenance

After years beyond which the warranty of components (panels, inverters, batteries and structure) decays can incur structural failure to substitutions.

In these cases please contact the manufacturer's service center, which will schedule the maintenance necessary to restore functionality and initial performance of "iKube".

8. Diagnostics and Troubleshooting

To defects or malfunctions of the machine described in this manual, please contact the manufacturer.

The diagnostic is reported through the Control Panel of the Inverter, so please consult its manual that accompanies this, to understand and be able to perform machine diagnostics and troubleshooting.

PARTS AND ACCESSORIES

1. Assistance

For any information concerning the use, maintenance, installation of the machine, the manufacturer shall be deemed always available.

The customer should ask the questions in clear terms, with reference to this manual and the instructions listed.

2. Parts

For any spare parts please contact the manufacturer.



The manufacturer is not liable for any damage, malfunction or damage to persons or property resulting from the use of non-original parts.

We advise against the use of aftermarket parts and, in case this happens, the conditions of warranty are annulled (if still outstanding) and so is the Responsibility of the Manufacturer in the use of the machine and any damage caused to persons and / or things.

In order to interact most effectively with our technicians when ordering parts, please follow the following steps:

- call the service parts of the D3 PRO SRL and describe the type of breakage;
- possibly describe the non-functional unit;
- trace the component of the machine in particular where it is located;
- especially by using the order form Request Info on Web site www.prod3.it.

ADDITIONAL INSTRUCTIONS

1. Waste disposal

It is the responsibility of the user, according to the laws in your country, to check the proper disposal of waste that the machine produces during processing.

The disposal of the replaced parts must be done according to the legislation in force in the country of using the machine.

2. Decommissioning and dismantling

When dismantling, it is necessary to separate the plastic parts, metal parts and electrical components, which must be sent to waste collection in compliance with current standards.

With regard to the metal mass of the machine, it is sufficient for the split between the ferrous parts and those of other metals or alloys, for a correct sending to recycling by melting.

To put out of service as mentioned above, you must:

- Press the OFF button on the control panel of the inverter;
- Open the circuit breaker;
- Press the emergency mushroom button;
- Disconnect the power cables
- Remove the batteries;
- Dismantle the machine;

